The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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Machine-Tool Works of Lodge, Barker & Co., Cincinnati.

The accompanying engravings represent the machine-tool works of Lodge, Barker & Co., at Cincinnati, Ohio. The building was erected from their own designs, with special regard to light and convenience, and occupies a space of 111 feet fronting south and running back 95 feet, with light on three sides. The plan, Fig. 2, shows the inside of the works from the center aisle; Fig. 1 is a general view. The light is thrown from the monitor each way to meet the light from the sides. The hight of sash in monitor is 9 feet. The second story fronts south 40 feet and runs back the entire width, 95 feet, and is lighted on four sides. As will be seen, the side lights around the whole structure are as close together as the framework will permit, and the roof and sides are covered with corrugated iron. The floors are 2-inch oak, dressed, laid on 4 x 4 inch cedar sleepers. Columns and girders are 15 inches square, and the distance from floor to ceiling is 13 feet in the clear. The large doors when open leave a clear space of 12 feet wide, which enables a large vehicle to be driven into the works to receive its load of finished machinery. The pattern shop is separated from the main room by a partition, and is fitted with the latest improved appliances for the quick manipulation of work required to be done. Adjoining the pattern shop on the north is the department in which rough castings are stored, each particular piece being laid in places properly marked and numbered. All patterns are lettered and numbered in the following order: Letter A represents all the patterns belonging to the largest machine made, each piece being marked with the letter A and numbered 1, 2, 3, &c. The places in which they are stored are also marked with letters and numbers to correspond. This system is especially valuable where the foundry is located some distance from the machine works. To the north of the storeroom for castings is the toolroom. In passing through this room the visitor will find several things worth considering.

The system of checks is about the same as in other first-class shops. But instead of drawings for small work for daily use, we found that actual samples were made from the original drawings completely finished and furnished to the workmen, thus showing the actual object to be made, and preventing any mistakes from a misunderstanding of drawings. In addition to the wear and tear which is so expensive when using drawings, we notice that the subject of milling has received considerable attention. Five milling machines are kept constantly at work on special pieces, which are finished with much greater facility than when planed, as formerly. Much ingenuity is displayed in making cutters to form the different shapes required.

Among other features we think the system of cards used for getting out rough stock is worthy of notice. The following diagram will give the idea. Letter B, 24-inch swing lathe:

Name of article.	No. of pieces.	Diam. Inch.	Lgth. Inch.	What material.
Live Spindle...	1	4¼	33¼	Steel.
Dead " ...	1	2¾	16¾	"
B. G. Eccentric	1	2	30¼	Wrought Iron.
Centers.....	2	1⅝	7⅞	Sq. Tool Steel

Every piece required on any particular machine is marked as per diagram. When a batch is commenced this card is handed by the foreman to the man who runs the cut-off lathe and centering machine, who thus sees at a glance length, size, what material and number of pieces are required. After being cut they are centered and distributed to the respective workmen who do the work. These are in turn supplied by the foreman with solid gauges for diameters and lengths. Simultaneously with the order for wrought-iron and steel stock is given the order for the requisite machines to the foundry, supplied with cards containing letter, name and number and how many of each are required. Every piece is thus put on its journey from the rough to the finished machine, and the whole process commences with the machine work at one end of the shop, and as it travels through its different stages it finally reaches the erecting department at the other end, where it is fitted and completed ready for shipment.

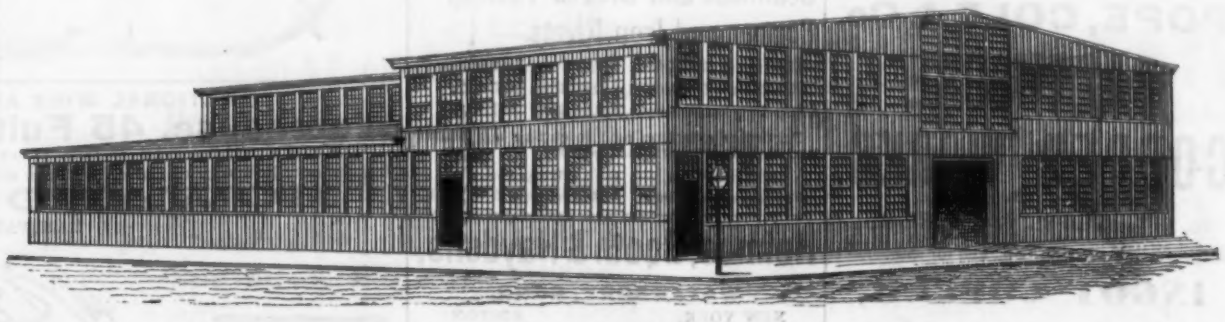

Fig 1.—General View.

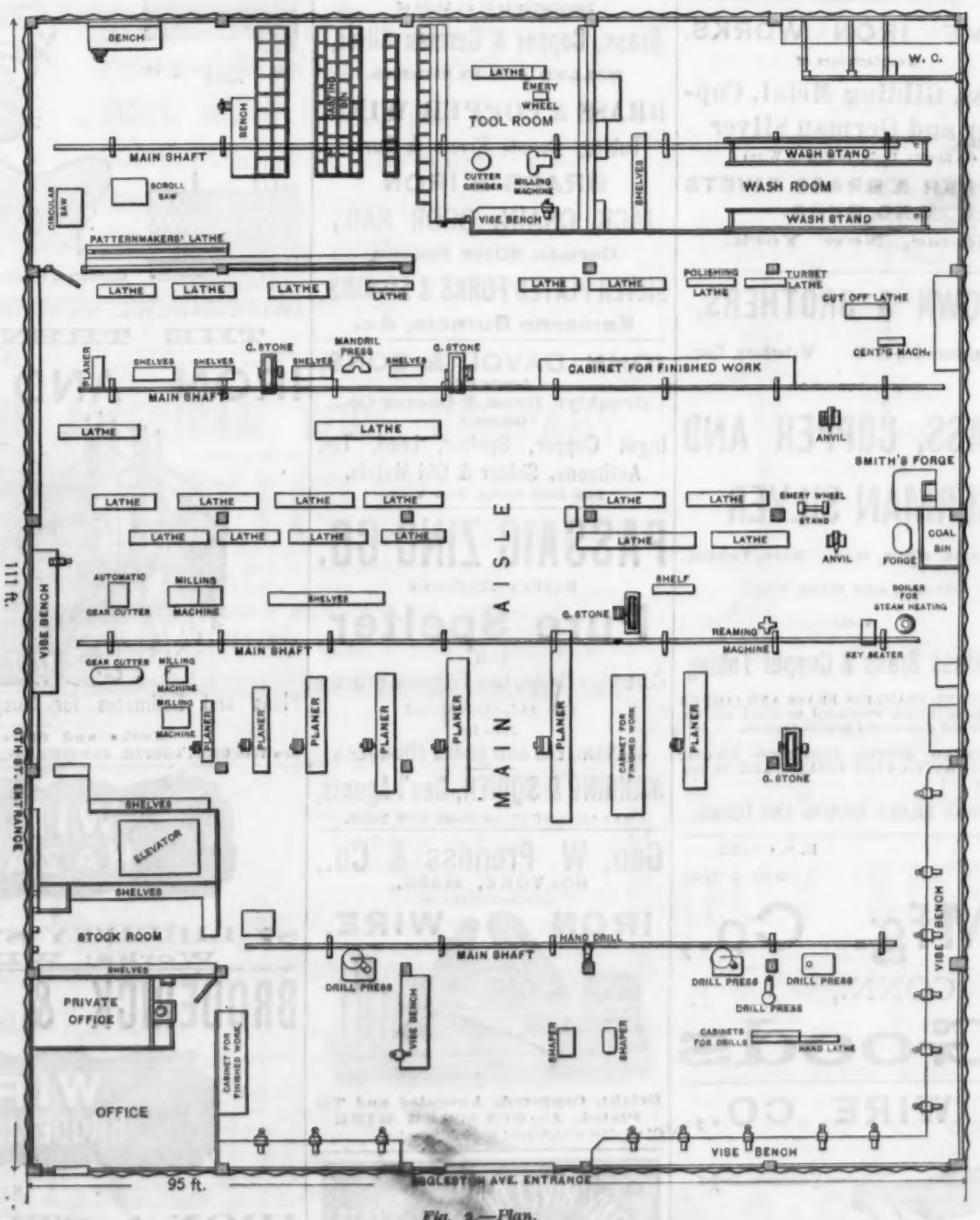

Fig. 2.—Plan.

MACHINE-TOOL WORKS OF LODGE, BARKER, & CO., CINCINNATI, OHIO.

METALLURGICAL NOTES.

Estimation of Manganese in Cast Iron and Spiegeleisen.

The following article by Mr. Charles L. Bloxam, we reprint from the London *Chemical News:*

The estimation of small quantities of manganese in presence of much iron by converting the latter into ferric acetate, and boiling the largely diluted solution to precipitate the iron as basic ferric acetate, is troublesome on account of the large volume of liquid to be boiled and filtered, an operation which must be repeated, for, unless the basic ferric acetate be redissolved and reprecipitated, the whole of the manganese is not obtained. Moreover, an unpracticed operator frequently fails to effect complete precipitation of the iron, or obtains the precipitate in such a condition that filtration is very difficult. A more convenient process, which I have not found described elsewhere, consists in precipitating the iron as ferric phosphate in presence of acetic acid, which retains the manganese dissolved. The metal is dissolved in HCl in a small beaker, the solution evaporated to dryness in the beaker, the residue dissolved in water with a little HCl, filtered from graphite and silica, the filtrate preoxidized by adding a few crystals of $KClO_3$ and heating, diluted with a convenient quantity of water, NH_3 added till the first-formed precipitate dissolves reluctantly on stirring, NH_3 mixed with excess of acetic acid (added in sufficient quantity to convert all the iron into acetate) and an excess of sodium phosphate. The cream-colored precipitate of ferric phosphate is filtered off, the precipitate redissolved (without washing) in HCl, the solution again nearly neutralized with NH_3 and precipitated with the mixture of NH_3 with excess of acetic acid. The two filtrates are mixed, an excess of NH_3 added and boiled, when the manganese is precipitated as the crystalline, very insoluble ammonio phosphate, which is filtered off and washed. As soon as the washings leave no residue on evaporation, the wet filter, with the precipitate, is placed in a platinum crucible, which is then covered and quickly heated to redness by a Bunsen burner. After ignition the precipitate is $Mn_2P_2O_7$. The precipitation of manganese as ammonio phosphate was recommended by Dr. Wolcott Gibbs. It is well, if possible, to keep the ammoniacal solution near its boiling point for an hour, and to set it aside for the night, though the greater part of the manganese is precipitated at once on ebullition. The ignited precipitate should be resolved in HCl and the solution mixed with ammonium acetate, to detect any ferric phosphate, which, if worth notice, may be ignited, weighed and deducted. For the determination of manganese in a sample of spiegeleisen, 10 grains were taken. This required about 100 grains of crystallized sodium phosphate. Three determinations gave, for the percentage of Mn, 10.1, 10.05 and 9.98.* Precipitation of the iron as basic acetate, and of the manganese as dioxide by bromine, gave 10.47 per cent., the precipitate containing, in addition to the manganese, the small quantities of copper, &c., which bromine always precipitates from the slightly ammoniacal solution. To estimate the manganese in a sample of gray cast iron 50 grains were employed, the iron being precipitated by about 300 grains of crystallized sodium phosphate in a solution diluted to about 10 ounces. Two determinations gave for the percentage of Mn 0.92 and 0.87, while the basic acetate and bromine process gave in two cases 0.87 and 0.83. Doubtless a closer agreement in the results would be arrived at by constant practice in the process.

*The ferric phosphate was found to be free from manganese.

Swedish Hearth and Welding Furnaces.

The "Foreign Abstracts" of the British Institution of Civil Engineers contains the following, which is from the German of G. A. Forsberg: The author describes a modification of the Swedish Lancashire hearth finery, which has been introduced at the Skutskär iron works. The hearth is of the rectangular form usual in Sweden, but differs from the ordinary construction in having a third tuyere in the back wall, that opposite to the working or front side. The side walls are formed of hollow iron castings, which are cooled by allowing the blast to pass through them, whereby it becomes heated before arriving at the tuyeres. The hearth is covered by an arched roof of brickwork, carrying a hopper closed by a slide, in which the charcoal is charged and dropped into the fire as required, instead of the old plan of shoveling it in through the working door in front. The waste flame, on its way to the chimney, passes over a bed in which the pig iron for the following charge is brought up to a strong heat before its introduction into the melting hearth. A comparative trial of one of these hearths against one of the ordinary kind with two tuyeres, carried on for a period of four weeks, gave the following results: The two-tuyere hearth produced an average of 265 cwt. of blooms per week, with a consumption of 5⅔ bushels of charcoal per cwt. The three-tuyere hearth produced 366 cwt. per week of bloom iron, with a consumption of 4 $\frac{3}{10}$ bushels charcoal per cwt. The loss in the metal in working was about the same in both cases, namely, 12.93 per cent., or 1.1485 cwt. of pig iron were required to make 1 cwt. of bloom iron. The author suggests a method for further increasing the production of this class of furnace by doing away with the melting of the pig iron in the refining hearth. For this purpose the heating bed for the metal in the flue is to be converted into a melting bed, which is kept warm by the waste flame during the actual firing period, and receives the heat necessary for melting from a gas producer, placed at right angles to the working axis of the hearth. Two hearths, placed back to back, communicate with the same stack, and are served by a producer common to both. The gas being only required during the melting period, the producer is damped during the refining of the metal in the hearth. The gas producer may be worked with inferior fuel, in which case the melting of the pig is done at less cost than in the fining hearth, where charcoal must be used. The welding furnace described by the author is a gas furnace with a flat bed about 20 feet long, and low arch, standing within its own blast-heating apparatus, the latter being a series of short upright and horizontal pipes, the former also being part of the structural ironwork of the furnace. The horizontal pipes are placed below the bed, and correspond in some degree to the long horizontal air-way in Bicheroux's furnace. The gas producer has a stack 10 feet high, shaped somewhat like that of a charcoal blast furnace, the bottom being closed by a grate arranged to work upon a central axis. The charging is effected by a gas-tight covered hopper and valves. The gas passes by a syphon up-take and down-come within the same mass of brickwork as the stack, to a chamber forming the ash-pit of the furnace, where it meets the heated air in jets from a square pipe in the roof, a short distance in front of the fire bridge. The producer is worked with waste short ends of deals and planks previously dried at 104° to 150°, the consumption being equivalent to 2.7 bushels of charcoal, supposing the wood to be equal to 63 per cent. of the latter. The loss upon the blooms heated for rolling into merchant iron was 11.5 per cent. A further modification of this furnace is provided with two similar gas producers which are worked alternately, the fuel charged wet in one being dried, while in the other it is being converted into gas. For the former purpose the gas-delivery passage is closed by a valve at the bend of the gas-delivery syphon, and the charging-valve of the hopper is opened while heated air from the hot-blast tubes is passed through the wet wood from below, until hygroscopic water is converted into steam.

Influence of Punching on Soft Steel.

The following translation of an article by W. Beck-Gerhard, in the *Gorni Journal*, St. Petersburg, we reprint from the "Abstracts of Foreign Papers" of the British Institute of Civil Engineers:

During the course of experiments made at the Poutiloff Works, at St. Petersburg, on the influence of punching on the strength of soft-steel fish plates, the results, already well-known, were arrived at, namely, that punching in the cold weakens perceptibly and reduces the elongation of the steel; that steel annealed after cold punching, and when punched hot, is not injured; that annealing, when well done, even increases the tenacity of the punched specimen, and that the evil effects of cold punching are in a great measure removed by subsequent reaming out of the hole. On bending samples of soft steel, which had been punched in the cold, through the holes, it was invariably found that the specimen would bend without cracking, if the punch side of the hole was on the convex side of the bend; but if the bar were bent in the opposite direction—that is to say, with the die side convex—the specimen broke. This was the case with all cast metal, while puddled or scrap iron could be bent without injury. This phenomenon led the author to institute an investigation as to whether there was any foundation for the generally received opinion that the edges of a punched hole on the die side are injured by a ring of minute incipient radiating cracks. For this purpose a large number of specimens, 5 inches by 3 inches by ½ inch, of all kinds of steel were prepared. The edges were planed, the surfaces polished, holes were pierced in various ways, and the metal surrounding them was carefully examined with a microscope, but no trace whatever of cracks could be found, though the nature of the steel ranged from 0.1 to 0.6 per cent. of carbon.

Although the search for incipient cracks proved fruitless, Mr. Beck-Gerhard observed and has described, he believes for the first time, certain markings on the polished surfaces of the plates around the cold-punched holes. Visible to the naked eye, and surrounding the holes, were sheaves or bunches of lines starting tangentially to the holes, and curving slightly toward them. These lines branch out in opposite directions and intersect with some degree of regularity. They do not appear in the vicinity of drilled holes, but are distinct in cold-punched holes reamed out. In forged iron they did not appear, although they were most distinct in the softest steel, and vanished when the metal reached the hardness due to 0.6 per cent. of carbon. An increase of thickness in the plate caused a corresponding increase in the number and clearness of the lines, upon which the shape of the hole was also found

(*Continued on page 5.*)

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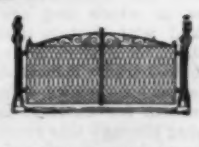

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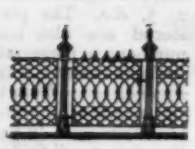

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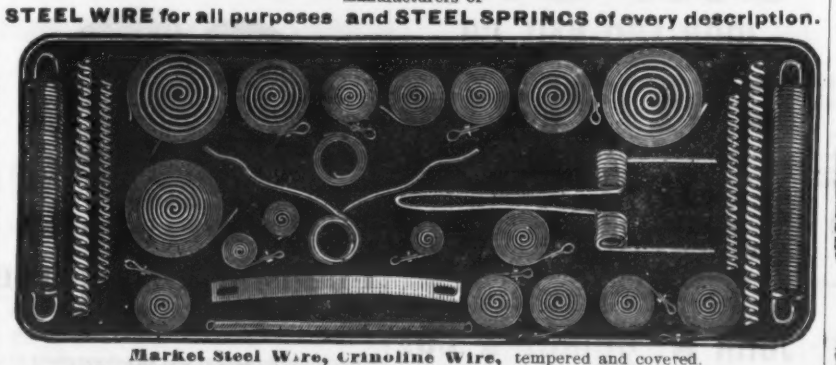

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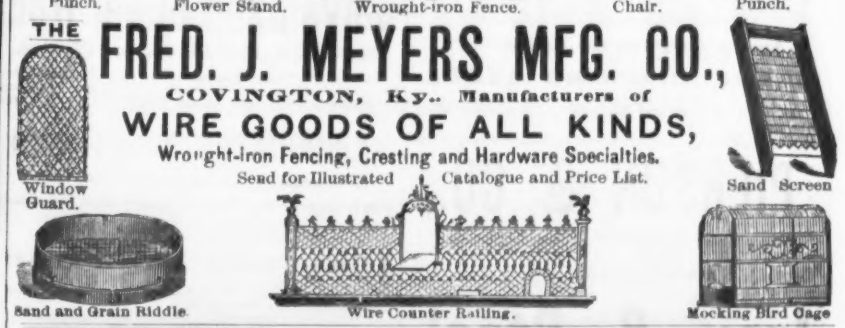

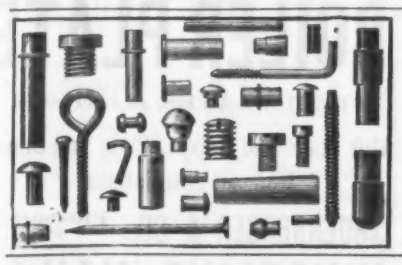

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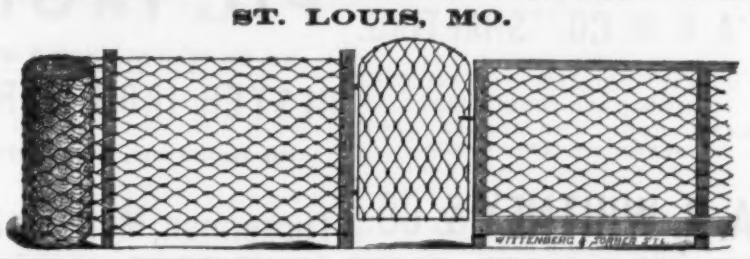

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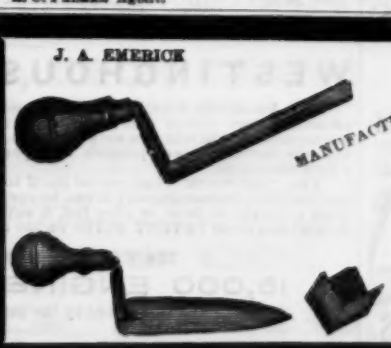

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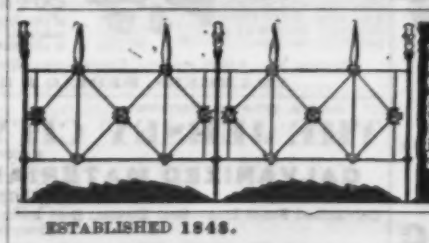

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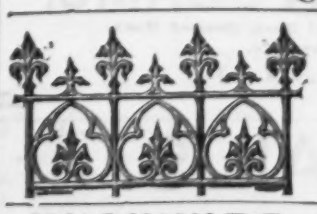

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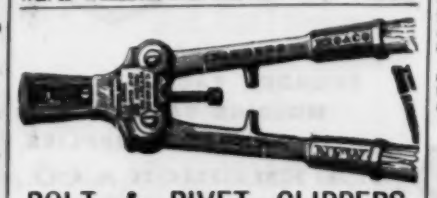

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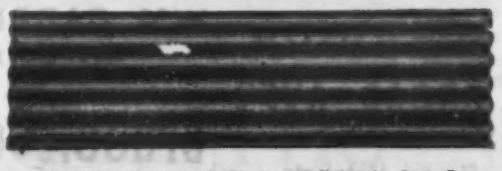

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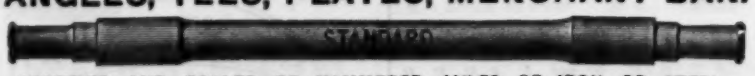

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fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron, Steel, Iron Ores, Slags, Limestones, Coals, Clays, Fire Sands, &c. Agents for sampling ores in New York and Baltimore. Price lists on application.

(Continued from page 1.)

to have an effect. In all the 5 x 3 inch specimens the lines were distinctly sunk, while in two of the 10 x 10 inch specimens the lines were prominent, sinking gradually to the level of the plate toward their ends. At the points of intersection near the holes the continuity of the lines was interrupted, dots or nodes representing their course. In the 3-inch specimens with planed edges the lines terminated abruptly at the edges, but in natural bars, such as fish plates, the more pronounced rays turned round the edges and actually appeared on the opposite side. In all the samples the lines were less developed in the upper or punch side of the plate, and even at times degenerated into a mere frosted appearance. Heating the plates to redness did not obliterate the rays, though it rendered them less pronounced.

In order to determine how far the rays extended around a cold-punched hole, a 10-inch square sample was cut out of a ⅝-inch steel plate, the surfaces were polished, and a 1-inch hole was punched in the center. The curved rays appeared very strongly marked on the die side, and less pronounced, but still very distinct, on the punch side. The surfaces of the plate were then washed with *agua regia*, when the rays disappeared, but the surfaces became streaked with elongated bubbles and hair-lines arranged in the direction in which the plate had last passed through the rolls. The sample was then cut into eight test-pieces, four on each side of the central hole, and subjected to rupture by tension. The result was an average ultimate strength of about 27 tons per square inch, with an elongation of 20 per cent. All the fractures took place at one of the elongated bubbles, and the polished surfaces of the specimens developed ridges and indentations, which could not only be seen, but felt. On placing the specimens together in their original relative position as a 10-inch square plate, it was at once seen that the markings on the strips formed together a system of curved rays around the central hole, precisely analogous to those which the solid plate had exhibited, only the rays extended much further over the surface. Test-bars cut from a similar ⅝-inch plate, 10 inches square, which had not been punched, exhibited none of the marks above described; hence it must be concluded that the effect or influence of the 1-inch cold-punched hole had extended all over the 10-inch plate. The observations made so far, the author considers, are insufficient for the foundation of a theory, and regrets that his occupations do not admit of further investigation.

Use of the Cowper Hot-Blast Stove.

At a recent meeting of the South Staffordshire Institute of Iron and Steel Works Managers, at Dudley, Mr. E. A. Cowper read a paper on "Hot Blast and the Economy in the Blast Furnace," in which he noticed the extensive adoption of the Cowper stove in the North of England, and its more recent introduction among the Staffordshire furnaces. In the discussion which followed the reading of the paper the general opinion was in favor of the stove. The chairman, Mr. Hudson, said they had two furnaces, one with the temperature at 900° and the other at 1500°, and they found the difference in favor of the hot-blast stove to be from 3½ to 4 cwt. of coke to each ton of iron. Moreover, the coal and slack, which amounted to 6d. or 9d. per ton of iron produced by the iron-pipe stove, was entirely sand, since more was needed in the hot-blast stove. The only repairs needed during eight years of use had been one change of the gas-valves and an occasional change of the hot-blast valves. In reply to a question as to what was the smallest hight and diameter which would admit of an efficient working of these stoves, Mr. Cowper stated that he had stoves at work in Switzerland whose dimensions were only 15 feet diameter by a hight of 28 feet. The cost of erecting a pair of stoves suitable for a furnace of 20 feet diameter and 54 feet high would be about £2000, and the royalty was £300. The chairman said that with a pair of stoves designed to work one furnace, and to make 350 tons of iron, they had blown two furnaces and made over 500 tons. They had made from one furnace as much as 300 tons of Staffordshire mine iron, with a consumption of between 17 and 18 cwt. of soft coke per ton of iron, and this with a furnace only 50 feet high. Mr. Cowper also showed a simple apparatus, consisting of a small gun and a knife-jointed rod, for cleaning the stoves. The bricks never melted or cracked or got spoiled in any way. He had bricks which had been in use seven or eight years, but which were as yet quite sharp. Mr. Cowper further said that it was not absolutely indispensable to have a close-topped furnace, since, if the chimney were tall enough, it could be worked with the open-topped furnace.

Inventions and the Leading Patentees of 1883.

To those good people who still imagine, as most people did half a century ago, that inventions are somehow obtained (not made) by a kind of happy accident, being a sort of golden manna coming down from the skies to a chosen and peculiar race—to such, a perusal of the Patent Office Report for a number of years would open up a revelation. Doubtless there will always be something of the accidental connected with the making of inventions, as there is with every occupation, but that this accidental feature is more than a mere incident is no longer true, however different it may have been in the past. In looking over from year to year the lists sent out by the commissioner, one cannot but note the regular appearance of certain names, and the increasing numbers of patents granted to a few of these; he will note, also, that as a rule each inventor works in a special department, concentrating all his powers upon one class of problems. Hence it often happens that the patents of a single inventor form a history outlining the progress of an art during his generation, supplemented, though it may be, by the works of his contemporaries.

Inventions are now but rarely the mere lucky findings of desultory ramblers in the fields of science, but, on the contrary, they

A. H. McNEAL,

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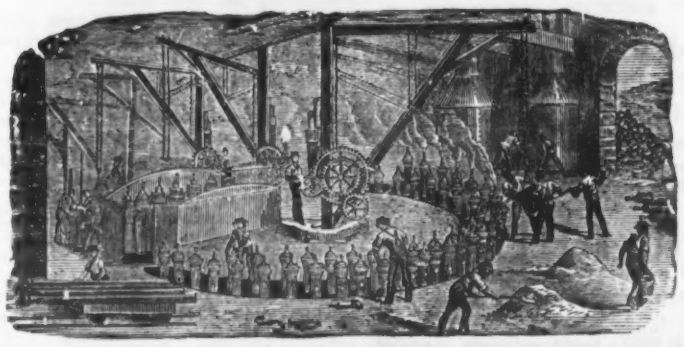
FLANGE PIPES.



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MODEL 1883 SHELL EJECTOR
32/100 CALIBRE
MANUFACTURED BY OTIS A. SMITH ROCKFALL, CONN. U.S.A.

NEW MAKE OF MINE LAMP.
THREE DIFFERENT SIZED SPOUTS
SEAMLESS BRASS COLLAR, BRASS HINGE, Solid Lid,
NO SOLDERING
THE HINGE CANNOT MELT OFF.
SEND 15 CENTS FOR SAMPLE TO
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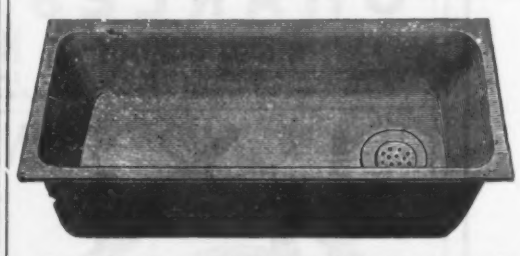
The Oldest and Most Extensive Manufacturers of
PUMPS, HYDRAULIC RAMS, GARDEN ENGINES,
Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

FIG. 199. FIG. 209. FIG. 70.

Wrought Steel Sinks.



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The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

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FIG. 114.

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Patent Copper Pumps,
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&c., &c., &c.

FIG. 114 REPRESENTS OUR
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are generally solutions to definite problems which have been methodically worked out by scientific processes, the practice of which has been reduced not only to an art, but, indeed, to a fine art. It is doubtful if the same number of men in any profession add more to the permanent wealth of the country than those engineer inventors who are to-day so rapidly changing the industries of the world.

In the volume recently sent out, containing the commissioner's report for 1883, it is stated that the number of applications in that year for patents for inventions was 33,073, the number issued being 20,312. Of this number 1344, about $\frac{1}{15}$ of the whole, were issued to 140 men, each of whom received half a dozen or more. Of these men 22 received 436 patents, an average of nearly 20 each. Edison leads, of course, with 65; Weston comes next, having 42 credited to him, and Reese and Henderson, of Pennsylvania, follow, represented by 23 each.

We subjoin a list of those granted six or more patents in 1883. It does not include patentees of designs, registrants of trade-marks or labels, nor reissues; but joint patents are counted to each patentee. A large number of patentees, among them most of the well-known engineers and inventors, including Crompton, Corliss, Maxim, Leavitt, Sweet, Sellers and others, received from one to five each. It will be seen that a great majority of those named reside in the larger cities, New York, Chicago and Philadelphia claiming respectively 20, 14 and 12, nearly one-third of the number:

Connecticut.—Bray, Morris P., New Haven, 7. Buell, Chas. E., New Haven, 11. Capen, Thos. W., Stamford, 8. Fuller, Geo. W., Norwich, 7. Palmer, I. E., Middletown, 7. Parker, D. W., Meriden, 6. Saladee, C. W., Lorrington, 7. Sparks, Wm. E., New Britain, 6. Thomson, Elihu, New Britain, 13.

District of Columbia.—Blumenberg, I. R., Washington, 7. De Smedt, E. J., Washington, 6. Hayden, H. F., Washington, 10. Osborne, J. W., Washington, 9. Sweet, P. H., Jr., Washington, 9.

Illinois.—Anderson, James C., Highland Park, 10. Baldwin, C. W, Chicago, 10. Bradley, B. C., Chicago, 7. Butlerfield, J. C., Chicago, 7. Cook, Geo. W., Chicago, 6. Dement, M. H., Chicago, 6. Harris, Arthur, 9. Haworth, Geo. D., Decautur, 6. Kelly, Geo., Chicago, 7. Martin, J. F., Chicago, 18. Norton, Edwin, Chicago, 8. Patterson, Wm. R., Chicago, 8. Pierce, H. M., Chicago, 7. Rew, H. C., Chicago, 6. Scribner, C. E., Chicago, 8. Stover, D. C., Freeport, 9. Van Depoele, C. J., Chicago, 19.

Indiana.—Anderson, Charles, South Bend, 6. Marmon, D. W., Indianapolis, 6.

Kentucky.—Kirby, John, Jr., Ludlow, 8.

Louisiana.—Menge, J., New Orleans, 6.

Maryland.—Walker, James T., Baltimore, 6.

Massachusetts.—Bernstein, Alex., Boston, 9. Dodge, T. H., Worcester, 6. Edson, J. B. Adams, 13. Elliott, G. R., Boston, 9. Goddu Louis, Winchester, 8. Hobbs, John, Boston, 8. Raymond, F. F., 2d, Newton, 7. Reed, Wm. S., Leominster, 7. Renshaw, David, Braintree, 18. Richards, Francis H. Springfield, 9. Torrey, J. R., Worcester 6. Walker, Geo. P., Lowell, 7.

Minnesota.—Bain, Foree, Minneapolis, 9. Edward, John H., Stillwater, 11.

Missouri.—McLean, Jas. H., St. Louis, 8.

New Hampshire.—Burton, Geo. D., New Ipswich, 11.

New Jersey.—Brooks, E. J., East Orange, 6. Collings, E. Z., Camden, 6. Condict, N.eW., Jr., Jersey City, 6. Daft, Leo, Gr enville, 12. Edison, Thos. A., Menlo Pa'k, 65. Flammang, M., Newark, 6. Hyatt, J. W., Newark, 12. Leadly, James E., Camden, 9. Lipsey, A. B., West Hoboken, 6. Perkins, C. G., Camden, 19. Searls-Anson, Newark, 6. Van Hoevenbergh, ——, Elizabeth, 8. Weston, Edward, Newark, 42.

New York.—Babbitt, B. T., New York, 8. Blessing, J. H., Albany, 11. Burgess, Andrew, Owego, 6. Campbell, Andrew, Brooklyn, 11. Crowell, L. C., Brooklyn, 10. Cullingworth, Geo. R., New York, 9. De Quillfeldt, C., New York, 9. Dederick, P. K., Albany, 6. Delaney, P. B., New York, 15. Devine, Silas R., Lock Sheldrake, 11. Emery, Albert H., New York, 21. Field, Stephen D., New York, 20. Freeman, Warren P., Brooklyn, 7. Gibbons, John, West Troy, 7. Gill, J. P., New York, 10. Hadden, Wm., Brooklyn, 7. Hanlon, John, New York, 8. Hayden, H. H., New York, 8. Hayes, Geo., New York, 8. Hey, Geo. W., Syracuse, 6. Hotchkiss, B. B., New York, 7. Hyatt, Thaddeus, 14. Hyde, J. B., 14. Jaeger, G. L., 10. Lockwood, C. S., Albany, 7. Miles, Wm. A., Copake Iron Works, 8. Nash, L. H., Brooklyn, 14. Newbury, H. F., Brooklyn, 7. Perry Stuart, Newport, 6. Reynolds, Geo. H., New York, 7. Richmond, C. M., New York, 11 Root, J. B., Port Chester, 7. Sacket, J. S., Plattsburg, 11. Sheehey, R. J., New York, 11. Thomas, E. T., New York, 11. Thomson, J. L., Syracuse, 9. Torrey, Dolphus, New York, 12. Tripp, James, New York, 6.

North Carolina.—Liddell, W. J. F., Charlotte, 8.

Pennsylvania.—Ball, Chas. E., Philadelphia, 6. Breen, Thos., Knowlton, 6. Clay, Henry, Philadelphia, 6. Converse, E. C., Pittsburgh, 6. Crowell, H. C., Erie, 7. Cummings, A. G., Harrisburg, 6. Drowbaugh, D., Eberly's Mills, 9. Finney, J. R., Pittsburgh, 6. French, J. F., Philadelphia, 10. Garsed, R. P., Norristown, 7. Hale, H. S., Philadelphia, 7. Henderson, James, Bellefonte, 23. Heysinger, J. W., Philadelphia, 6. How, W. S., Philadelphia, 7. Hunter, R. M., Philadelphia, 7. Mayall, T. J., Reading, 10. Onderdonk, J. P., Philadelphia, 6. Orton, L. O., Philadelphia, 6. Pike, C. F., Philadelphia, 17. Reese, Jacob, Pittsburgh, 23. Schulze-Berge, H., Pittsburgh, 7. Skinner, Le Grand, Erie, 7. Spang, H. W., Reading, 6. Starr, Eli T., Philadelphia, 19. Strohm, S. D., Philadelphia, 6. Westinghouse, Geo., Jr., Pittsburgh, 9.

Ohio.—Brush, Chas. F., Cleveland, 11. Davis, J. S., Toledo, 10. Edwards, Edgar A., Cincinnati, 9. Frash, Herman, Cleveland, 7. Miller, Lewis, Akron, 6. Mosler, M., Cincinnati, 6. Wilmington, Wm., Toledo, 6.

Rhode Island.—Prentice, Geo. W., Providence, 13. Smith, F. A., Jr., 10. Thayer, James F., 7.

Siemens' Telegraphic Cable Works.

A large number of the British Society of Engineers recently visited the telegraphic cable works of Messrs. Siemens Bros., at Charlton, where they had the opportunity of witnessing the various processes connected with the preparation of the materials used in the manufacture of these cables, as well as the manufacture of the cables themselves, and also the various kinds of electric telegraphic instruments and apparatus. From the reports of their visit we gather the following particulars concerning the method of making submarine cables:

The principal materials used in the manufacture of telegraph cables are wire, india-rubber, gutta-percha and hemp. In some cases the wire conductors are covered with india-rubber, and in others with gutta-percha, the cores being thus formed. The india-rubber is obtained in its raw state chiefly from Para, and the first process of manufacture is to rid it of its impurities. To this end it is cut into pieces and passed many times through rolls placed in pairs and running at differential speeds, so that a grinding as well as a squeezing action is obtained. A stream of water is continually running on the rubber, which carries away the impurities, and when the water runs clear it is an evidence that the cleaning process is so far complete. After this purification the rubber is dried at a moderate temperature, and afterward rolled into sheets of three classes. One consists of pure rubber sheets, while in the other two sulphur and other necessary ingredients are incorporated with the rubber. The sheets are then cut into strips or tapes ready for use in the covering machines. In the wire-covering department the conductors are incased in strips of these rubbers of one kind or the other, according to requirement, by being passed through machines in which the wire is, so to speak, sandwiched in between an upper and a lower strip, the edges being carefully trimmed off. In one machine wire was being coated with the pure rubber, while in another a conductor was being inclosed first in a white and then in a pink-colored rubber casing. The coverings are afterward solidified and made homogeneous by heat.

Another department is devoted to the covering of the conductors with gutta-percha, which, like the rubber, has to be first purified and prepared. The raw material in this case is obtained chiefly from Singapore, and is first cut up into slices by machinery. It is then soaked and softened in tanks of hot water, after which it is taken to a machine called a "ticker," or "devil," where it is shredded and discharged into hot water. It then undergoes complete mastication in special machines, whence it is transferred to hydraulic presses, where it is forced through strainers of fine wire gauze, which arrest all remaining mechanical impurities. It is again washed and masticated in boiling water. Various kinds of gutta-percha are afterward blended and finally rolled into sheets and stored. The wires are covered with gutta-percha by being drawn through machines having specially-constructed dies, in which the gutta-percha is contained under pressure and kept plastic by heat. As the covered wires leave the dies they pass through troughs of cold water and are led on to a second, and if necessary to a third, machine, according to the number of coats required. The insulated wire or core is conducted to the sheathing department, where it is first covered with hemp and afterward with iron wire by machinery. It is then passed through other machines, in which it is covered with two more layers of tarred hemp wound on in opposite directions. The cable is now completed, and as it is made it is stored in tanks, of which there are eight in the large tank-house, each tank being capable of holding 400 miles of cable. In a second tank-house there are eight more tanks of smaller capacity. From the tanks the visitors saw the cable being payed out to the telegraph cable ship Faraday.

An important feature in the manufacture of deep-sea cables is the testing, which is carried on throughout every stage from first to last, and on board the Faraday as the cable is being stored, so that it is impossible for a fault or flaw to occur without detection. The electrical testing-room of the works was, therefore, inspected with interest, as was also the pressure tank, which is a very ingenious contrivance for testing a cable core under the same conditions, as regards pressure, as those under which it exists at the bottom of the Atlantic in its deepest part. The apparatus consists of a small circular steel tank only about 30 inches internal diameter and some 5 feet deep, but weighing about 24 tons, the cover alone weighing 3 tons. Into this tank a length of about 2 miles of core wound on a reel or drum is lowered and the tank closed and locked by the screwed cover, the ends of the core being connected with the testing-room. Hydraulic pressure is then applied up to 4 tons per square inch—6 tons per inch can be applied if necessary—the core remaining under this pressure for about 10 minutes, during which the electrical testing is carried on. The machinery in what is known as the old cable shop is driven by a pair of compound horizontal surface-condensing engines of 180 horse-power indicated, that in the new cable shop being driven by a beam engine of 80 indicated horse-power. The cable works give employment to about 2000 men, another 1000 being employed in other directions.

Excessive Brainwork in Schools.—It is a noteworthy fact that the question of how to properly counteract the generally depressing effects of excessive brainwork in schools is now being seriously considered abroad, and the measures there taken, if satisfactory, should commend themselves elsewhere. Official action with reference to overpressure has been taken in Prussia, Saxony, Wurtemberg, Baden and Alsace-Lorraine. Experience in German schools, those of other countries as well, has shown and the same has undoubtedly been found in that physical exercise alone is not a sufficient antidote to brain pressure, and the remedy which was sought in a reduction in the number of hours of study, while not having completely solved the difficulty, has afforded considerable relief. A commission which was

Paris, 1878. *For Superiority.*

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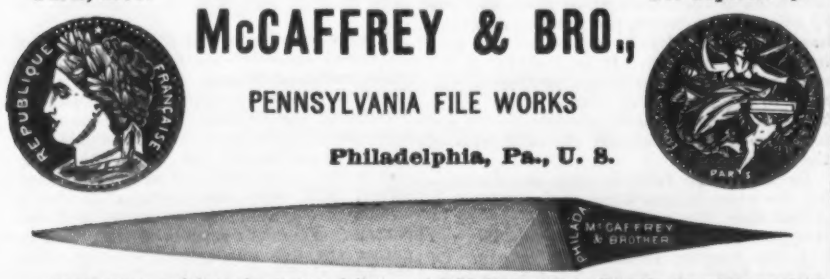
Philadelphia, Pa., U. S.



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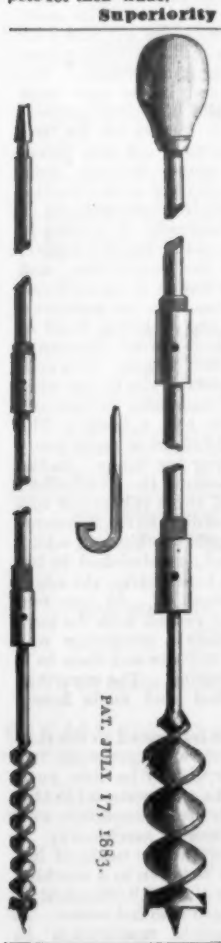

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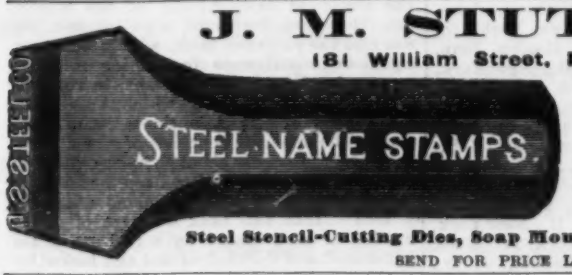

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Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-Ender),
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Handsaw Taper, double-cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
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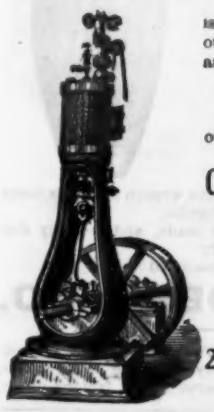

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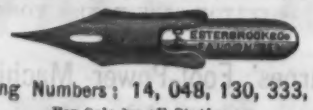

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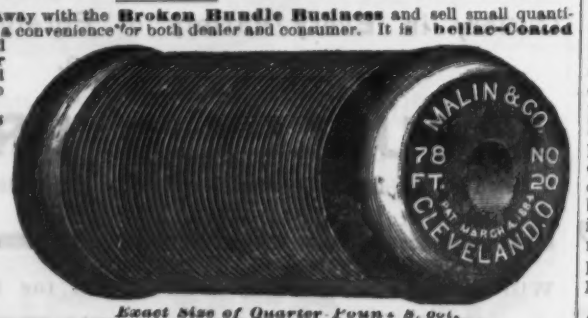

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appointed in Alsace-Lorraine some time ago recommended that the number of study hours should be restricted to 26 a week for the lowest classes of the gymnasia, and to 28 and 32 for the higher classes; that the hours of home study should be 8, 12 and 18 a week, progressing from the lowest class to the highest; and, finally, that six hours a week should be devoted to general physical exercise. Similar provisions in the higher institutions of learning would be of the greatest benefit, and the constantly increasing demand for more time in which to assimilate the matter presented should not be left unheeded.

New Inventions.

The Matthiesen & Hegeler Iron Company of La Salle, Ill, have patented a furnace for roasting ores, the patented improvement relating more particularly to the means for stirring and discharging the ore. The furnace is composed of a number of roasting ovens open at both ends. Before the ovens there is placed on each side a frame supporting a series of rods or gas-pipes, which are adapted to be temporarily attached to rake-heads and which are connected with mechanism for drawing them through the oven. Between the furnace and the frames sufficient space is left for a car. Each rake is provided with one or more heads made of a flat bar beveled from the top down to a sharp edge at the bottom in front. The heads are either square behind or beveled so as to form a triangular bar, and are provided with a bail or link for attaching them to the rods. The sides of the rakes are made of flat iron, arranged to scrape the sides of the oven and prevent the ore from packing. A separate rake for each two ovens on the same level is employed, and when not used the rakes are left on the platform of the car to cool.

A patent for an ore reducing and smelting furnace has been granted to J. C. Newbery, J. L. Morley and B. Cleveland, of Melbourne, Australia. The furnace has a number of upright smelting retorts interposed between the fireplace and reducing chamber, the retorts having a separate hearth and taphole. The heat from the fire plays around these retorts, and then passes to the roasting chamber and out of the escape flue to the precipitating chambers. The oxide in the retorts, charged with layers of oxide and carbon, becomes heated to such an extent as to be reduced by the carbon, and, passing through the carbon at the bottom, is discharged as metal on to a solid bed, from whence it runs through a taphole into a proper receiver. Combustible gases or liquids may be used as a partial substitute for the solid carbon in the retorts, but a thick layer of carbon must always be placed at the bottom.

The following process of extracting oxides of cobalt from ores has been patented by H. Herrenschmidt and M. Constable, of Sydney, Australia. The ore is first crushed and its percentage of oxides of cobalt is ascertained. Then sufficient sulphate of iron is added to convert the oxides into sulphates. The ore, if wet-crushed, should have sufficient water added to make it into slime. In this condition it is boiled for an hour in any suitable vessel, when the whole of the oxides will have been converted into sulphates and held in solution by the liquor in which the slime has been boiled. The thick residue is then washed of all remaining solutions, so as to remove every trace of the sulphates, the solutions being then treated with any of the well-known materials for reconverting sulphates into oxides. Instead of the boiling process, the sulphate of iron in the shape of salt may be mixed with the dry-crushed ore and heated in a furnace until the sulphate of iron has been converted into an oxide of iron and the oxides of cobalt into sulphates.

A metal car-wheel made in two sections which are united so as to form practically one solid metal wheel has been patented by W. G. Hamilton, of Ramapo, N. Y. The tire has a shoulder projecting from its inner face, and a number of inwardly-projecting equidistant lugs of dovetail form. The center or body of the wheel is also flanged or shouldered, and is provided with outwardly-projecting dovetail lugs corresponding to the spaces between the tire-lugs. After the tire is heated the center piece is slipped into the tire, and is then revolved a short distance, so as to bring the lugs of the tire and center piece in line and cause them to interlock. The spaces between the lugs are now filled up with soft metal poured in through holes extending through the center piece. To take the wheel apart it is heated until the tire is expanded and the soft-metal filling is melted. It is claimed for this wheel that it is impossible for any part of the center or tire to fly off, however badly the wheel may be fractured.

An apparatus for filling core-boxes with sand has been invented by H. S. Garle, of Chicopee Falls, Mass. Heretofore a core-box was usually filled from the sand heaped around its mouth, and one hand was employed to push in the sand while the other was used to ram it down. The inventor arranges above the core-box a funnel held upon a ring socket which is attached to a horizontal arm of an upright or standard. The arm may be clamped at various hights, and the funnel is adapted to receive end pieces with different diameters, so as to adapt it to different-sized openings in the core-boxes to be filled. With the above apparatus a core-box may be filled by one hand only, and sufficient material may be provided at the beginning to complete the core. The tamping-rod is of a length to extend from the bottom of the core-box to beyond the upper edge of the funnel. As it is always guided by the sides of the funnel, a uniform length of stroke may be imparted to it from the beginning to the completion of the core.

A furnace door, more particularly designed for locomotives and marine engines, has been patented by H. I. Bearup, of Elkart, Ind. This door is so arranged that it is opened by stepping upon a treadle, and it is automatically closed by releasing the treadle. In this way the fireman need not use his hands to operate the door, and the latter is not left open any longer than absolutely necessary, thus admitting very little cold air. The door consists of a right and left section tapering toward the top and hung on a common pivot. To each section there is attached a lever, and these levers, by a system of toggle-joint links and rods, are connected to a rock-shaft which is arranged in front of the furnace. The rock-shaft may be placed beneath the floor, and is provided with a foot-piece and also with a hand-lever. Thus it may also be operated by hand if desired. By means of a sliding weight upon one of the connecting-rods which counterbalances the weight of the door, the fireman may adjust the amount of pressure necessary to exert.

A machine for drawing bolts which have been previously headed is of the following description: A draw-head adapted to grasp the bolt-head is attached to a slide to which reciprocating motion may be imparted. In front of the draw-head and at the right and left side of the same are pivoted two dies which, when brought together, leave a circular opening between them. The dies are first swung apart to permit the introduction of the bolt. Next they are closed and the slide is drawn backward, carrying the bolt with it and forcing it through the dies. In this way a cylindrical form is given to the bolt. By varying the space between the dies and the draw-head, the length of the square shoulder to be left on the bolt directly back of its head may be determined. H. E. Coy, of Mansfield, Ohio, the inventor of this machine, states that it will test the strength of the iron and show any defects or flaws in the bolt-head.

A wire nail machine patented by G. N. Cooper, of Haverhill, Mass., is of the following description: The wire is passed between guide rollers to a feeding-block to which reciprocating motion is imparted. It is then subjected to the heading dies, of which one is rigidly secured to the machine, while the other is alternately raised and lowered. An upsetting hammer pivotally connected to the machine first approaches and then recedes from the dies. When it approaches the dies it strikes the projecting end of the wire and upsets it into the head-forming cavities. Cutting-off or pointing dies are also provided which have both transverse and oblique cutting edges. The transverse cutting edges sever the wire transversely, leaving its ends substantially flat, while the oblique cutting edges cut wedge-shaped chips from the opposite sides of the wire to point it. The nail, being completed, is dislodged by means of a clearer and drops into a suitable receptacle.

A portable wire fence which may be folded during transportation has been patented by G. Norris, of Scottsburg, Ind. It consists of a series of upright metallic slats, perforated at top and bottom, so as to be fastened to the ordinary upper and lower cross-pieces which are secured to the posts. A continuous wire connects the several slats, being carried alternately up and down to form a series of interlocking loops. At the upper and lower ends the loops pass through eyes fastened to the slats, and are thus held in place. In the intermediate loops the wire, besides interlocking with itself, is also bent around the slats to make the entire structure compact.

A piston for steam engines, which does not require any packing, has been patented by G. Dieckmann, of New York City, in the United States and in several foreign countries. The two opposite faces of the piston are not flat, as customary, but are curved inwardly, thus presenting two concave surfaces to the action of the steam, gas or other power. The edges of the concave surfaces which are in contact with the cylinder walls are made tapering, diminishing in thickness toward the ends of the piston. When steam is admitted into the cylinder it will, besides moving the piston up or down, bear laterally against the tapering edges of the piston, and thus drive them against the cylinder walls. The amount of lateral pressure will be proportionate to the amount of pressure on the piston, and thus the frictional contact between piston and cylinder will always be proportionate to the total pressure. In this way the piston, it is claimed, is always properly tightened without the use of any additional packing.

A spike extractor invented by E. T. Sharp, of Boston, Mass., consists of a long handle carrying a curved head at one of its ends. To the right and left side of the head are riveted curved steel jaws that project a short distance beyond the head, and are turned in at their extreme outer edges, to leave a small groove or opening between them. This opening is of a width sufficient to admit the body of the spike, without allowing the head to pass. The points remain beneath the spike-head until the spike is entirely drawn out, the curved back of the implement sliding somewhat on the tie, to permit a steady upward movement, while at the same time the fulcrum changes continually. As the jaws are formed separate from the body, they may be made of a better grade of steel, as they receive the principal strain.

A self-wedging ax-head has been patented by H. H. Trenor, of New York City. The eye in the ax-head is made of tapering form, being widest at the top of the head. In securing the handle to the head the entire handle is passed butt first through the eye. In order to allow the butt to pass freely through the eye its form is somewhat modified, it being flattened at its sides and extended at its heel and toe. The inventor states that the eye may thus be kept within the desired limits as to the width, while its extension lengthwise, to accommodate the heel and toe, is not objectionable. At the bottom the head is provided with a downwardly-extending flange which surrounds the handle. The object of this flange is to support the handle at the point where it is strained the most, and also to increase the wearing surface of the socket.

The Ashley Wire Company, of Joliet, Ill., have purchased one-half the patent right in a new barbed-wire galvanizing apparatus invented by F. Crich, of the same place. The wire passes first through an acid bath and thence through the galvanizing bath, in both of which it is held submerged by drums or lantern-wheels. Each drum is composed of two heads connected by lenticular spindles which readily pass through the molten metal. From the galvanizing bath the wire enters a wipe-box which is provided above

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FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and

SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESS:—
E. M. REED."
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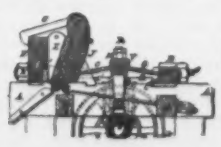

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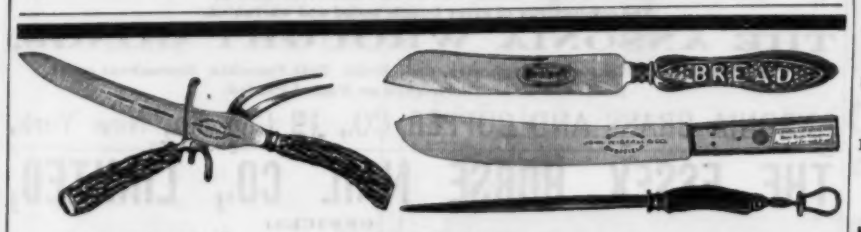

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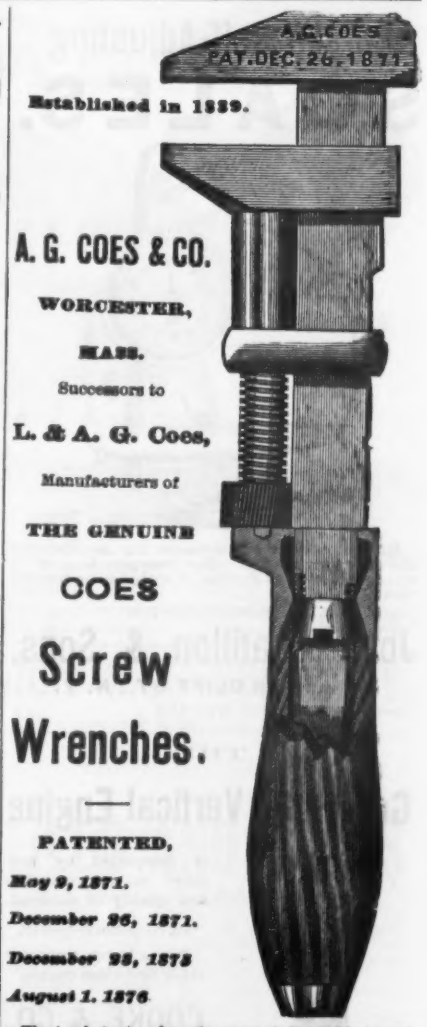

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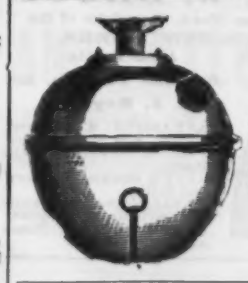

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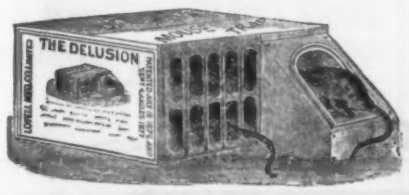

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He's in a cage, somehow or other,
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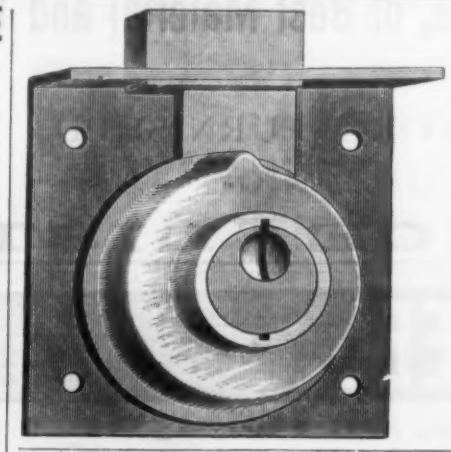

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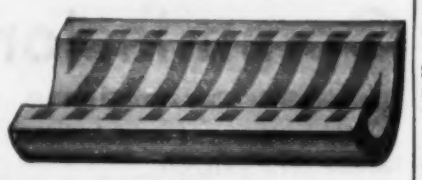

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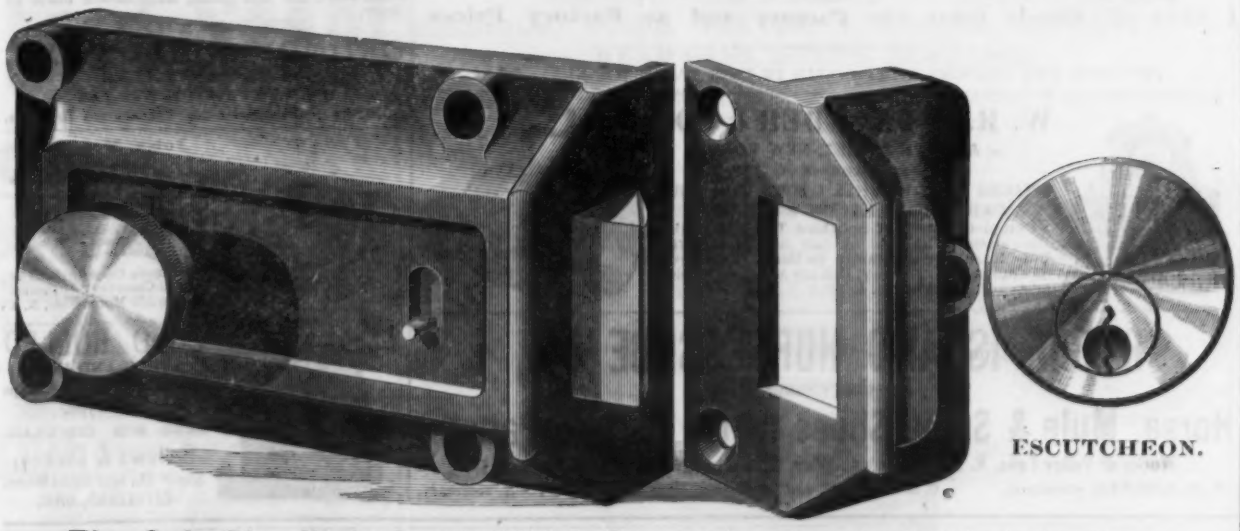

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the wire with a vertically-reciprocated plunger which pounds down and compacts the wiping material. By means of a hopper at the side of the box the wiping material drawn out by the barbed wire is replenished. After leaving the wipe-box the wire passes through a sand-box which smooths and brightens it. Finally the wire runs over a drum which is partially submerged in water.

A. Jamieson, of Chicago, Ill., is the patentee of an apparatus for distilling chloride of zinc. The apparatus consists of two lead-lined tanks closed at the top and connected by a curved pipe. At the bottom of each tank there is a coil of pipe, and one of the tanks is provided with two superposed shelves. The first tank—that is, the one without the shelves—is partially filled with water to which salt and sulphuric acid are added. Under the action of steam from the coil of pipe a vapor is given off which rises to the top and escapes into the second tank. This tank, called the condenser, is also filled with water, and pieces of zinc are placed upon its shelves. The vapor from the first tank passes under the water line of the second tank, and, intermingling with the contents, acts on the pieces of zinc and produces chloride of zinc. At the beginning of the operation it is not necessary to admit steam into the condenser, but in order to produce the proper action near the end steam is finally admitted through the coil of pipe placed on the bottom of the condenser.

S. Johnson, of Brockport, N. Y., has patented an apparatus for making small castings. The flasks are received by a crane and placed in piles about a central stand-pipe which has radial conduits that enter the cast apertures in the back. When ready for drying, a pipe connects the furnace with the stand-pipe and hot air is passed through the flasks, drying the mold from the inside. When dry this pipe is removed and a ladle of molten iron is raised by the crane, so that the metal is poured into the stand-pipe and thence into the molds. After the casting or pouring operation is completed, the iron in the stand-pipe is tapped off through a discharge aperture and run into ingots. The claim of the patent covers the combination of a central crane with a stand-pipe having a series of radiating conduits.

Alarm Among Sheffield Gun-Makers.

In the manufacture of heavy guns a number of Sheffield manufacturers have won great distinction. They have built up a large trade with various nations, their main dependence, however, being upon the British Government, whose patronage enables them to provide the expensive machinery needed in their peculiar line of manufacture. The following article, which appears in a recent issue of the Sheffield *Telegraph*, indicates that there is danger of the Government entering into the manufacture of guns, which would be greatly to the detriment of the Sheffield gun making firms, who are alarmed at the prospect of "Government competition," as it is termed by the *Telegraph*:

It is stated that the authorities at Woolwich have erected several Siemens-Martin furnaces with the view of manufacturing steel for gun forgings and other purposes. This intelligence is especially serious in view of the decision of the war authorities as to the gun of the future. Up to the present, the guns used by the British Government have consisted of steel tubes with wrought-iron coils; henceforth they are to be entirely of steel. It is primarily, no doubt, for the manufacture of these steel guns that the Woolwich authorities have undertaken the task of attempting the production of steel castings on a large scale. It is hard to see how these can be made at Woolwich Arsenal so cheaply as in Sheffield. Woolwich is a long way from both coal and iron, which will have to be brought from the North. Four of our large local firms—Messrs. Thos. Firth & Sons, Messrs. Charles Cammell & Co., Messrs. Vickers, Sons & Co. and Messrs. Wm. Jessop & Sons—have laid down most costly machinery, and after many elaborate experiments have acquired an experience which cannot be attained at Woolwich off-hand. If anything made by a private firm should prove defective it is returned; at Woolwich, of course, the defective article will either have to be used or a serious loss incurred.

The works in Sheffield are capable of making the largest and most intricate forgings and castings required by the British or any other Government; and, as a matter of fact, have met and are meeting all possible requirements of the war authorities here and abroad. It is within our knowledge, too, that the Government have been informed of the readiness of local firms to increase their power of production, if needed, to any extent that may be required. A statement has been made by an official of considerable standing, that he could not rely on the quality of the steel supplied from this district. There must be some grave error here, as the Sheffield firms are supplying their material to foreign Governments, whose tests, to say the least, are quite as severe as those at Woolwich. They are also supplying the steel tubes for Sir William Armstrong, who, at his well-known works at Elswick, manufactures a large quantity of heavy ordnance. In addition to the Sheffield firms and the Elswick establishment, at Newcastle-on-Tyne, there are also the works of Sir Joseph Whitworth, at Manchester. In fact, the productive powers of private firms in this country are equal to any strain which may be put upon them, and it is difficult to see why under such circumstances the officials at Woolwich should seek to shut up the manufacture of ordnance in that arsenal.

Our foreign neighbors, who are quite as wise as ourselves in these matters, are content to be served by private firms. Germany is satisfied to be supplied by Krupp, and France has never evinced any desire to plunge into competition with her own manufacturers. The step is unquestionably an unwise one from a national point of view. It is simply impossible at Woolwich, far removed from the raw material, to produce steel castings as cheaply as in Sheffield, and they can only be made after costly experience, for which the rate-payers will have to be taxed. Besides, is it wise to discourage private enterprise throughout the country and have all our eggs in one basket at Woolwich? Is it not like risking a great collapse in the face of a crisis, which may in the complications of Continental affairs come at a time when we are at least prepared for it? Locally, the question is very grave. If Woolwich is to monopolize the business for our own country there will be idle plant and reduced employment. It is matter for the workman as much as the employer. If the country could possibly gain by the change, something might be said for it; but the probabilities are all the other way, and in the present condition of affairs, with a fleet far feebler than that of France, it is not the time for officials to engage in "fads" of this description.

Why a Boiler Burst.

Referring to an inquest held at Chesterfield Station, England, a little while ago, on the death of the attendant of a traction engine whose boiler burst, the *Mechanical World* supplies particulars respecting the manner in which such boilers are worked, which, while unquestionably remarkable, ought not to cause very great surprise, the information brought out from time to time on similar occasions having been sufficiently startling to make almost anything seem possible. In the case in question, the safety-valves were loaded by means of springs which had not only been screwed down until the valves were jammed fast on their seats, but one of them had a thin nut fixed between the safety-valve and its spindle, to insure that the valve should be effectively jammed. The water gauge had been dispensed with, because the glass tubes were apt to break, and one of the owners was afraid of being cut, and the pressure gauge was so insanely wrong that when the actual pressure on the boiler was 280 pounds per square inch the pressure shown by the gauge was only 140 pounds, and when the gauge registered 144 pounds the actual pressure was about 300 pounds. "As the gauge, which was graduated to 200 pounds," remarks our contemporary, "was seen to indicate 180 pounds, it is probably beyond the power of any one to say what pressure was on the boiler, but the Board of Trade surveyor informed the jury that when a pressure of 80 pounds was put on a standard gauge, the pressure registered by the boiler gauge was 179 pounds only."

It would, of course, be too much to expect that those in charge of the boiler and engine knew anything about their proper management, and the verdict returned by the jury was as such verdicts generally are. The man was found to have been killed by the bursting of a traction-engine boiler from overpressure, brought on by his own negligence, and the owner was considered highly censurable in having inefficient steam and water gauges. It was, moreover, recommended that there should be compulsory examinations of traction engines at stated intervals, and that those in charge should be compelled to obtain certificates after giving proof of their qualifications for their duties. Perhaps such certificates are entitled to respectful consideration in England, and are there really representive of the holder's qualifications, but in many places in this country, where almost everybody knows how they can be obtained and how much confidence is to be put in them, this plan would practically be of little value. Compulsory examinations of the boilers would scarcely yield the desired results either here or elsewhere, and there thus remains the oft-repeated but commendable suggestion of making the owners themselves responsible for whatever damage may result from failure of their boilers.

Call to the Inventors of Illinois.

Under this heading the following circular has been issued, which we publish by request:

GENTLEMEN: You are urgently requested to assemble at the Sherman House, in the city of Chicago, to attend the first State convention, which will be held on the 23d, 24th and 25th day of October, for the purpose of thorough organization and mutual protection. In Congress last year an attempt was made to invade our rights by a class of dishonest manufacturers, who were the promoters of the attempted invasion, under the pretext of protecting the innocent purchaser. This attempt to rob the inventor was checked by the prompt action of the National Association of American Inventors, together with other gentlemen who realized the danger to the country by this proposed legislation against its greatest interest. I hope every inventor in the State who reads this circular will fully realize the importance of this convention, and that he will be present to give his counsel in the deliberations, the object of which will be a thorough organization of the State and the election of delegates to the National Association, which will convene in Buffalo in January, 1885, where it is expected that Illinois will be represented by a large delegation of her brightest genius.

J. T. DOUGINE,
Vice-Pres. Nat. Asso. of Amer. Inventors,
1446 and 1448 Wabash ave., Chicago, Ill.

What is stated to be the largest suspension weighing machine in existence has just been constructed by Messrs. Henry Pooley & Son, Glasgow. In itself the machine weighs 2 tons 16 cwt., and is graduated to weigh from 28 pounds up to 100 tons, while it has been certified by the Board of Trade to bear a strain of at least 120 tons The machine consists of an upper link or band of wrought Bessemer steel, by which it is suspended from the shears. Beneath this is the weighing machinery, and inclosed within a waterproof box is the graduated scale covered with nickel silver to prevent rust. The lower part comprises a link of Bowling iron, from which is suspended the article whose weight is to be ascertained.

Nearly 300,000 patents have been issued by the United States Patent Office, of which 3508 are classed under the head "railways," and 3505 as "railway cars." Of the 7000 patents thus indicated, probably about one-half apply to car couplers, and still inventors are at work.

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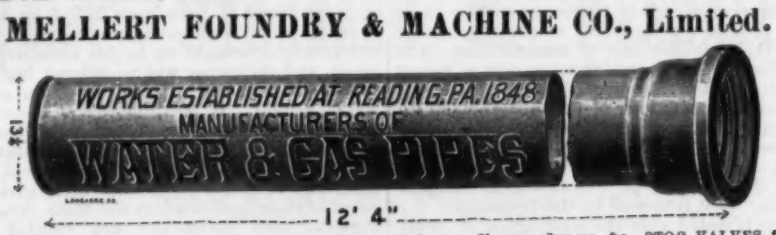

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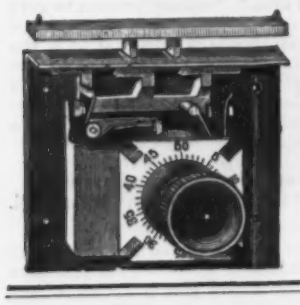

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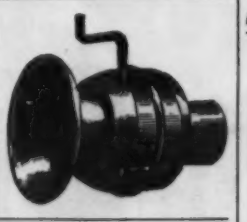

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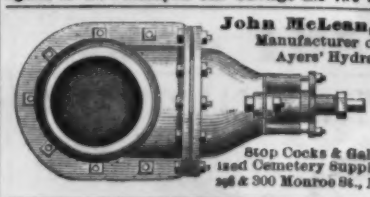

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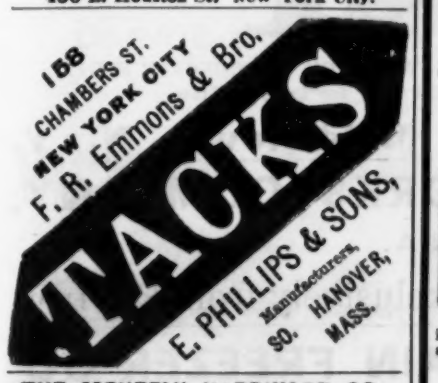

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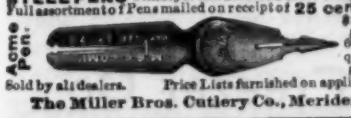

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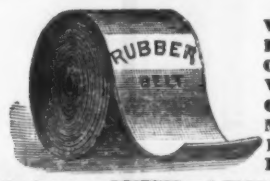

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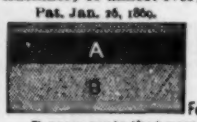

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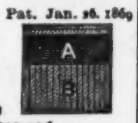

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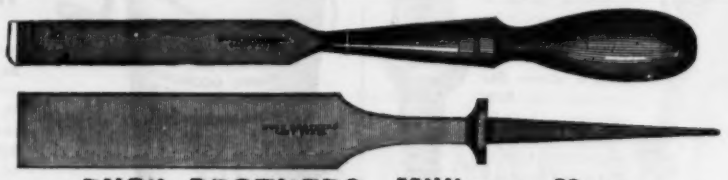

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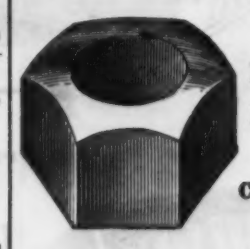

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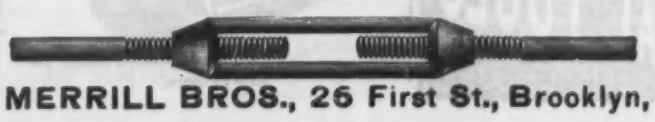

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The Metric System.

In a communication to the Philadelphia *Public Ledger*, dated at Eisenach, August 24, Mr. Coleman Sellers, a member of the firm of William Sellers & Co., of Philadelphia, gives his impressions of the very slow progress the metric system is making toward general adoption among the leading nations of the world, together with a statement of his objections to the system. He says:

A pouring rain that prevents sight-seeing and almost hides the towers of Wartburg Castle on the hill opposite gives me a chance to say a few words about an article recently published, which says that the librarian of of the Paris Geographical Society has prepared a table showing what countries have adopted the French metric system and have made its use obligatory. The total population of these countries is given, and it professes to show that the people who use this system are vastly more numerous than those who do not, and among the minority are mentioned Great Britain and the United States. Thus, those using the system aggregate, say, 241,972,011, as against 97,639,825 not using it.

I notice among those countries where this system is said to be in compulsory use Norway, Sweden and Denmark. Now, I have just visited these three kingdoms, and while there I made it my business, as I have done in other countries, to make a full inquiry into the practical operation of the French metric system. I find that the Governments of the three countries above mentioned have adopted the system, and have appointed a date a few years in the future when its use will be obligatory, but as yet it is not in general use, except among the employees of the Government or in the Government depots. The people at large know little or nothing about the subject, and small progress has been made toward preparing them for the change. In the railroad stations may be seen charts hanging on the walls that give the system in a graphical way, and the weight of the luggage upon which an extra charge is made is computed in kilos, not in pounds; while everything weighed in the shops or marke s is reckoned in pounds or measured by a "yard-stick," which is 25 of our inches in length; this I give from actual measurement, although the shopkeepers say that the Swedish measure for cloth is two-thirds of the English yard. In Denmark so little is known about the enforced adoption of the French system that an important shopkeeper told me that it was never to be adopted.

What I wish to make clear to your readers is that the mere fact that the inhabitants of the countries using the metric system are more numerous than those of the countries which do not use it does not furnish so strong an argument in favor of the enforced adoption of this system as would at first appear. The interests involved and the industries which would be affected by the change must be considered. The uprooting of any established system of weights and measures is a matter of very serious import, aside from any question of the relative merits or demerits of the adopted or abandoned systems, and this is especially true of manufacturing countries where vast and varied processes depend upon established standards. It is not an exaggeration to assert that the confusion and loss caused by a change in the system of measurement in Russia, with her millions of peasantry, would be less than that sustained in the city of Philadelphia alone from a like cause. England and America combined control the majority of the commerce of the world. England and America combined lead the engineering output of the world.

To the merchant who buys and sells it makes no matter if the yard is one of 25, or 36, or 39.39 inches long, nor if the pound weighs more or less than a pint of water; but to the engineer the matter is of more vital importance. I have gone this summer through the workshops of almost all the great countries on this side of the water and in those of Germany. I have seen the practical use of the system that I have for so long a time condemned. I frequently asked engineers if they like the system, and if they use it, and I will give the answer of one in Berlin: "We use it because we have to, and it is better to have some uniform system than the many measurements that formerly prevailed in the German States. The unit of the machine shop is the millimeter in everything except bolts, nuts and screws. All bolts and nuts are made to the English inch, because we use the Whitworth system. We do not like the metric system, because it has too small a unit, and the meter is too large and involves the use of decimals."

In Philadelphia the firm of William Sellers & Co. adopted the French metric system in an important part of their works as long ago as 30 years, and have continued its use since, until their workmen are as familiar with it as with the inch. With all this long practice during my connection with the firm I have written and spoken against the enforced adoption of the system, not only because of the expense involved in changing, but because it is not a practical system; it permits of no elastic gradation of shop or trade sizes. The millimeter is taken as the standard to avoid the complication of the constant use of decimals, as nearly all measurements in machine work are less than 1 meter. This small measure involves many figures, and does not permit any good memorizable series. The inch cut up into the natural division by constantly halving permits the use of sizes best suited to the needs of the workmen.

The standard of the French system is a certain bar, kept for comparison; so is the English yard, from which we get our feet and inches. The high-flown notion that the meter is a measurable portion of the quadrant of the earth's circumference has been given up long ago, and the measurements of England and America are on a better basis of accuracy to-day than those of any other country. The French system theoretically predicates its weights on the weight of a cubic decimeter of distilled water at a temperature of 39.1° F., the weight of which is called the kilogramme, and is 2.2 of our pounds; but really the standard unit of weight is the platinum-kilogramme weight deposited in Paris.

Swedish iron and steel are rolled to English inches in size; so, also, their boards are cut to the English inch, because their market is largely in those countries which use the inch. In the Russian machine shops the English inch is used exclusively, and, as I have said, throughout all Germany it holds for all screw sizes. In France and in Belgium the yardstick is the meter hung from a rod like the cross-bracket of a drop gas light, placed about 18 inches above the counter. In Germany the half-meter, or 26 inches, about, is the measure used, and that held in the hand of a salesman by a handle at one end of the measuring stick. The Swedish machinist carries in his pocket a rule on which he has the English inch, and by its side the French measures; on the other side he has the two Swedish feet, one long in use, and one ordered to be used, but never put into practice. The Swedish roads are laid out now in kilometers, and marked by iron plates, giving at each 10 km. the distance from some place, while half-way between is a sign "5 km." This division of the roadway seems to them to be fine enough, as the old Swedish mile was 6⅔ of our miles, and 5 km. is a less distance.

In Germany you never hear of the kilo, but they sell by the pound, their pound being the half of 1 kilo; this they cut up as they please into smaller weights, and you can buy half a pound of grapes or butter just as well as you can in America. It is claimed that, given the meter, all weights, &c., can be deduced from it. In theory this is very well. The most skillful workmen, however, are not yet able to make two liters of water weigh alike to the utmost point of accuracy, and the cubical liter is not used, but is converted into a circular or cylindrical vessel, with all the trouble of the problem of squaring the circle.

If a bar of ordinary forged iron be planed up to measure 1 inch square, and the bar be 1 English yard long, it will weigh 10 pounds, and the tenth of such a bar will weigh 1 pound more accurately than will the ordinary liter of water weigh 1 kilo. The English engineer in these days of iron knows when he uses shapes of iron rolled of uniform section that the tenth of their weight in pounds per yard gives him the area of the section, and this one admirable incident will long fix the desirability of the present unit of England and America. When we consider the interest involved it will be seen that the population now making practical use of the English standard is greatly in excess of that using, by force, the French system. Millions of those numbered among the people who use the French system have no occasion to use any or know any system whatever save in the crudest form.

Carefully as I have considered this subject of weights and measures during the time I have been from home, I am the more confirmed in my opposition to the enforced adoption of the metric system of France in my own country, and firmly believe that those countries that have adopted it are at a disadvantage as compared to even the most imperfect of our systems. America has entered on the line of simplification of its metrology, and that is the direction that should be followed, not by any means giving up what is good, but by making what has been found to be practical better and simpler. One has not to be long in England to find out how firmly are the seemingly complicated systems of weights and measures of that country fixed with the people. They weigh by the stone and compute by the sterling currency as rapidly or more so than we do with our dollars and cents, and that because their unit is larger. The English shopkeeper knows nothing about decimals, and says, if you ask him, that he has never learned what they are. England has lately made legal the admirable standard manufactured by Sir Joseph Whitworth, and the chance of her adopting the metric system is not in the most remote degree possible.

The Oakland Glass Works.—A San Francisco exchange says that regular work has been begun at the Oakland Glass Works. Demijohns, bottles, flasks and fruit jars already have been made at the works. The white sand from which the glass is made comes from a beach at Monterey owned by the company. It comes from the beach so clean that no washing is necessary before putting it over the fires. Claret bottles will be made at the Oakland factory. Nearly all used on this coast now are made abroad. The demand is said to be about 50 gross per day for the Pacific coast. One of thes pecialties of the works is a fruit jar with a new device for closing the top. The furnaces are heated by a bed of Sydney coal, 6 inches deep.

At Sheffield, England, recently, a well-known registered trade-mark, "The Elephant Nonpareil," was sold by auction. It had been registered by the Cutlers' Company, and under the Trade-mark Registration act, in Classes 5, 6, 7, 12 and 13, embracing the whole of the Sheffield trades, and, having been on the register since the passing of the act, is absolutely indefeasible. It had likewise been registered in Germany, and is well known in the United States and India. The vender of the mark was Mr. Robert Marsden, of the Tinsley Park Iron Works. The mark was put up at first for £100, and the bids slowly rose until £160 had been offered. Then the competition became very keen, and by advances of £10 the sum of £200 was soon reached, then £300, then £400, and afterward £500. Then bidding continued until £580 was the amount reached, at which figure the mark was sold to W. Tyzack, Sons & Turner.

Dr. Aron recently exhibited, at a meeting of the Berlin Electrical Society, various specimens of vegetable carbon, which were made conductors and rendered almost incombustible by energetic and prolonged heating in a vacuum or in a neutral atmosphere. These properties are so much like those of graphite that the product may well be called artificial graphite, although it is not crystalline. The experiments show that if, as has been affirmed, the presence of hydrogen in graphite determines its combustibility, this can be true only of combined hydrogen, for carbon which has been calcined and made incandescent in an atmosphere of hydrogen is no more combustible than before.

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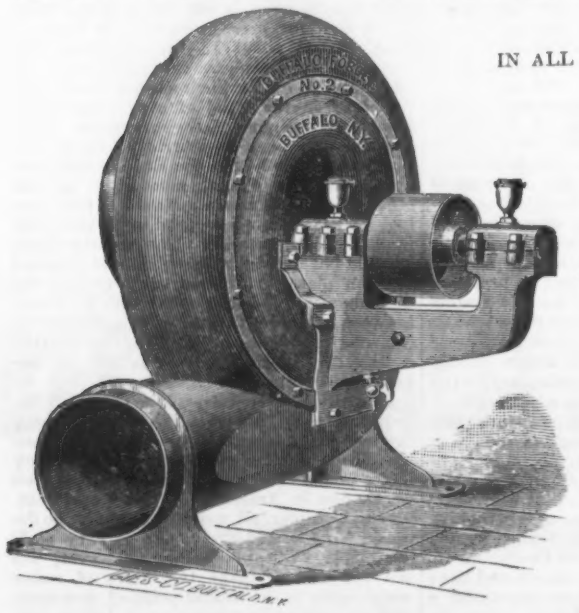

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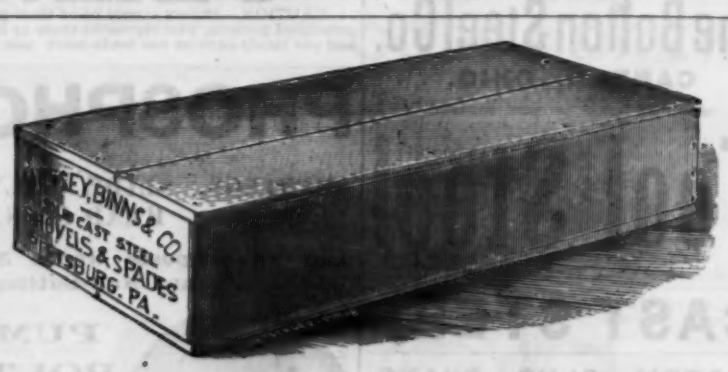

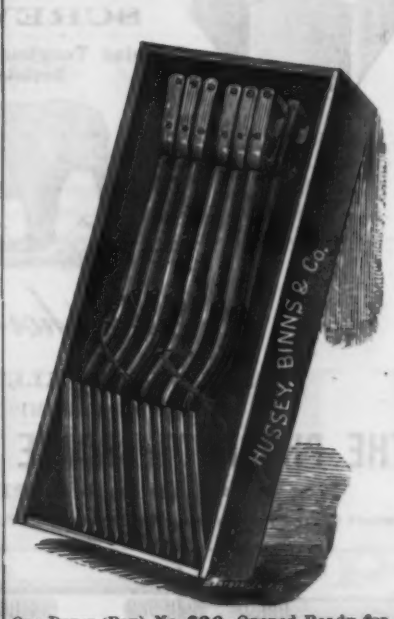

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The Days of Crucible Steel Numbered.

The following letter to the London *Times*, by Sir Henry Bessemer, was written in reply to the paper read by Mr. Seebohm at the late meeting of the Iron and Steel Institute, at Chester. The first part of the paper referred to, which has created quite a stir in metallurgical circles, will be found in this issue:

Will you kindly allow me space to correct, as briefly as possible, the erroneous impressions unavoidably conveyed to the public by the quotations you have made from the paper read by Mr. Henry Seebohm at the Chester meeting of the Iron and Steel Institute? I much regret that the state of my health prevented me from being present on that occasion, or I should have at once challenged the correctness of the statement made by him. First, then, as to the following paragraph: "Sir Henry Bessemer had attempted to produce an article at £6 a ton to compete with one at £60 a ton, and had failed absolutely. Sir Henry might have half ruined the wrought-iron trade and revolutionized the pig-iron trade, but the crucible cast-steel trade held its own in spite of his great discoveries." Now, sir, I simply deny the truth of this statement. What I did attempt was to make cast steel from English pig iron of a quality similar to that sold for about £10 per ton at that time in Sheffield, and I succeeded in producing cast steel bars, of which over 1,000,000 tons were produced in this country last year, and which were sold at prices varying from £4. 15/ to £5. 5/ per ton. I also did attempt to produce the highest quality of cast steel by my patented process, using for that purpose Swedish pig iron, costing £6 per ton, in lieu of using Swedish bar iron, costing, according to Mr. Seebohm, £25 per ton, as the raw material of the manufacture; the best proof that I did not "fail absolutely" in this attempt is afforded by the indisputable fact that for two years I manufactured and sold bar steel so made for £42 per ton, among the regular purchasers of which were several of the highest commercial firms in England. I may further state that it is a well-known fact that in Sweden cast steel has long been made direct from pig iron by the Bessemer process, and been manufactured into cutlery and other cutting tools of the highest possible quality, and the same thing is also now being done in Austria (see the unbiased report of the judges on steel and cutlery at the Vienna Exhibition).

I pass over without comment Mr. Seebohm's insinuation that "Sir Henry might have half ruined the wrought-iron trade and revolutionized the pig-iron trade," for I had for a long time past been under the impression that I had given to the world a much more valuable material in exchange for wrought iron. However this may be, I entirely deny the correctness of the latter part of the paragraph, viz.: "That the crucible-steel trade holds its own in spite of his great discoveries." I am at a loss to imagine how any person living in Sheffield and carrying on the business of a steel-maker can be ignorant of the fact that thousands of tons of Bessemer steel of all grades and tempers are manufactured and sold in small billets of a convenient form expressly to suit the Sheffied manufacturer, and are by them wrought into an almost endless variety of articles for the production of which crucible steel alone was used prior to the introduction of the Bessemer process. Surely, Mr. Seebohm must also be perfectly well aware that thousands of tons of Bessemer scrap steel, such as rail ends and other waste or imperfect pieces of Bessemer metal, are bought up and used by Sheffield crucible steel-makers, and, further, that the steel so made is sold as crucible steel, thus adding immensely to the sum total reckoned as crucible steel made in Sheffield. If Mr. Seebohm will take the trouble to look into such technical journals as *Engineering*, *Iron* or the *Ironmonger*, he will find week after week references made to the constant and ever-increasing substitution of Bessemer steel for crucible steel in the various manufactures carried on around him, and he will in those journals also see by the advertisements of a Sheffied metal broker that "he always keeps on hand a stock of Bessemer scrap steel and rail ends for crucible steel melters." Notwithstanding all this, I most freely admit that genuine crucible cast steel is still made in Sheffield in some quantity by all the best manufacturers, either from Dannemora iron or other Swedish bars, and, when so made, it is a material at present unsurpassed in quality by other processes, although I can show by irrefragable proofs that it has been and can be fully equaled. It may possibly take another 20 years to stamp out all the nonsense and prejudice with which the subject has been industriously surrounded, but, notwithstanding all such efforts, I can but feel that the days of crucible steel are numbered. Your most obedient servant, HENRY BESSEMER.

HASTINGS, September 24.

To the above Mr. Seebohm has replied as follows:

May I be allowed a few words in reply to the letter from Sir Henry Bessemer? No one was more disappointed than myself at not meeting Sir Henry at the hospitable table of the Dean of Chester. I have no doubt that Sir Henry is perfectly sincere in stating that his attempt to make the best cast steel by the Bessemer process was a success, and that the reason why it has been abandoned is the "nonesense and prejudice" with which, in Sir Henry's opinion, the subject has been industriously surrounded. In my opinion the reason is to be found in the practical difficulties which I pointed out carefully in my paper, and which you were kind enough to quote in your report of it. Sir Henry admits that he gave to the world a much more valuable material in exchange for wrought iron, but designated my supposition that he half ruined the wrought-iron trade as an insinuation. I thought in my innocence that I was paying the highest possible compliment to the inventor of the Bessemer process, which I described as probably the most brilliant success of the century. Why Sir Henry should accuse me of ignorance of the fact that thousands of tons of Bessemer steel are used in Sheffield for purposes for which crucible steel was formerly used, after my statement that the commoner qualities of crucible cast steel had been to a large extent superseded by Bessemer and Siemens steel, I cannot understand, and I am still more puzzled to know why Sir Henry should think this an argument to prove the falsity of my statement that the crucible-steel trade holds its own in spite of his great discoveries. He does not venture to challenge the truth of my statement that, notwithstanding the substitution of Bessemer steel for crucible steel in multitudes of cases, the amount of the latter now produced in various parts of the world is probably double that which was required before the birth of its rivals. To say that the crucible-steel trade "holds its own" is a statement that only errs on the side of excessive modesty.

We crucible-steel makers regard Sir Henry Bessemer and Sir William Siemens as our greatest benefactors. The splendid discoveries of these two great inventors have caused such a demand for machinery that we have been enabled to do a profitable trade during the whole of the 10 years during which our big brothers, the iron-makers and the Bessemer and Siemens steel-makers have been under a cloud. Sir Henry and Sir William between them have robbed us of a considerable portion of our comparatively unprofitable trade in common cast steel, but they have given us in exchange a more than compensating increased and ever increasing demand for the more profitable branch of our trade—that of best cast steel. We are profoundly grateful to them for having done so, and we sincerely wish (our gratitude containing an element of the lively sense of favors to come) that a succession of good harvests may bring our big brothers also another wave of prosperity, in which we may expect to have our small share of the plunder. In conclusion, I can assure Sir Henry Bessemer that if he or any other inventor will show us how to prevent the occluded gas in Bessemer or Siemens steel made from phosphor-free iron from causing honeycombs in the ingots, without adding any ingredients that may injure the quality of the steel, he will not find that any "nonsense or prejudice" will prevent us from adopting it. In the meantime I submit that the expression of the opinion "that the days of crucible steel are numbered" is, to say the least of it, premature. I see no reason why there should not be a long and prosperous future for the process of making best cast steel, which was invented 140 years ago at Doncaster by Benjamin Huntsman, the Quaker clock-maker.

Launch of the Atlanta.

On the 9th inst. the United States steel cruiser Atlanta was launched at Roach's shipyards, Chester, Pa. A large crowd of people witnessed the launch, which took place shortly after 3 o'clock, the vessel going down the ways without any mishap or difficulty. She was then moored under the shears to receive her machinery and boilers. The Atlanta has a length of 270 feet, 42 feet beam, 17 feet draft and a displacement of 3000 tons. Her armament will consist of two 8-inch and six 6-inch breech-loading rifles. Outside the forward port angle an 8-inch long-rifled gun will be mounted in a barbette, 3 feet high, built of 2-inch steel plates. The forward gun has a train from 40° abaft the beam on the port side, sweeping the whole deck forward to 30° abaft the beam on the starboard side; similarly for the other gun. Within the superstructure formed by the removal of the poop and forecastle to the center of the ship six 6-inch breech-loading rifles will be mounted—two on each broadside, with a train of 60° before and abaft the beam; one forward, on the starboard angle, giving a total train of from 20° across the beam to 60° abaft the beam, and the remaining gun similarly mounted on the port side aft. The crews of the 6-inch guns are protected from the fire of machine guns from an enemy's tops, and the guns cannot be fouled or disabled by falling spars and rigging. The manipulation of the guns is simplified, and the service of ammunition much safer and more convenient. The 8-inch guns will carry an armored mantlet as protection against machine-gun fire. The Atlanta will be bark rigged, with a spread of 10,400 square feet of canvas. The indicated horse-power is 3500, the engine driving a screw 17 feet in diameter, with 20 feet pitch, giving a sea-speed of 13 knots per hour. The capacity of her coal bunkers is 580 tons, giving an endurance of 2500 miles at full speed, and 5000 miles at 10 knots an hour. The contract price for hull and fittings, exclusive of masts, spars, rigging, sails, boats, &c., is $618,000. The complement of men is 230.

Bursting a Large Gun.—On the 7th inst., at Annapolis, Md., a large cannon burst on the United States steamer Standish. The steamer was in command of Lieut. John F. Meigs, who had the third division of the first class of naval cadets on board, the division numbering about 15. The cadets had fired five shells at a target 700 yards distant in Chesapeake Bay, when on the sixth shot the gun burst with a tremendous crash and shiver of the timbers of the ship. No one was injured, all the pieces flying over the heads of the cadets and crew. The gun was a muzzle-loading Parrott, converted into a steel-lined breech-loader. It was run out from the port side of the quarters, and fortunately the cadets were steadying the gun on the right side. Had they been on the other rope a fearful loss of life would have occurred. This is the second gun of this kind that has burst on the Standish, and one of the same make was found cracked on the Wyoming.

English reports show that in 1858 the quantity of copper raised in New South Wales was 58 tons, valued at £578. In the following year the quantity sank to 30 tons. Since then, with the exception of two or three years, there has been a steady annual increase, until in 1883 the quantity reached 8957 tons 7 cwt., valued at £557,201. The total quantity raised during the period 1858–83 was 61,051 tons 17½ cwt., valued at £4,115,486.

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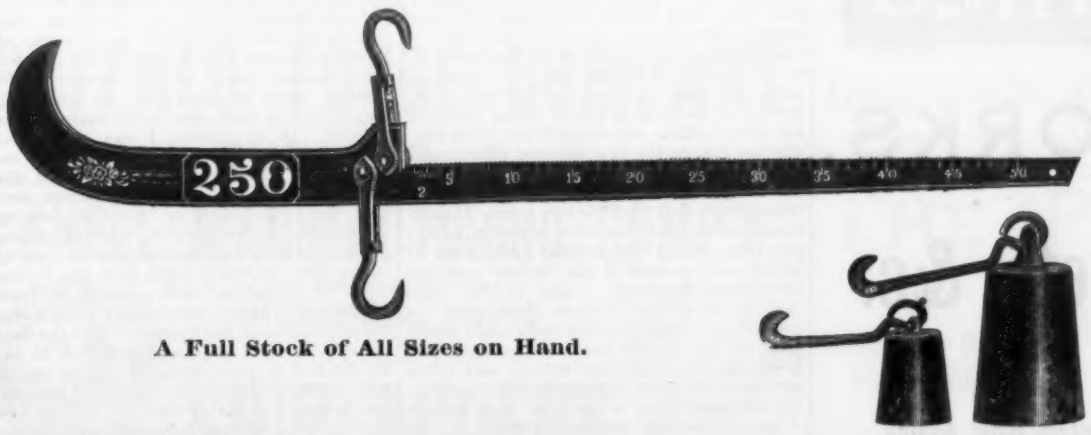

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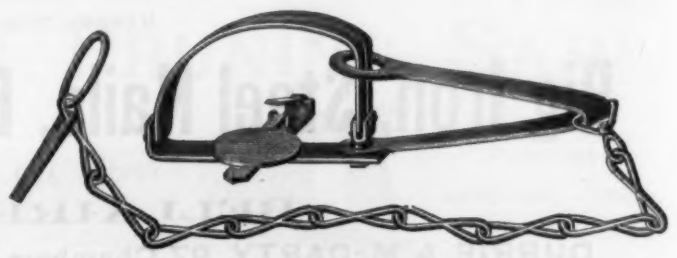

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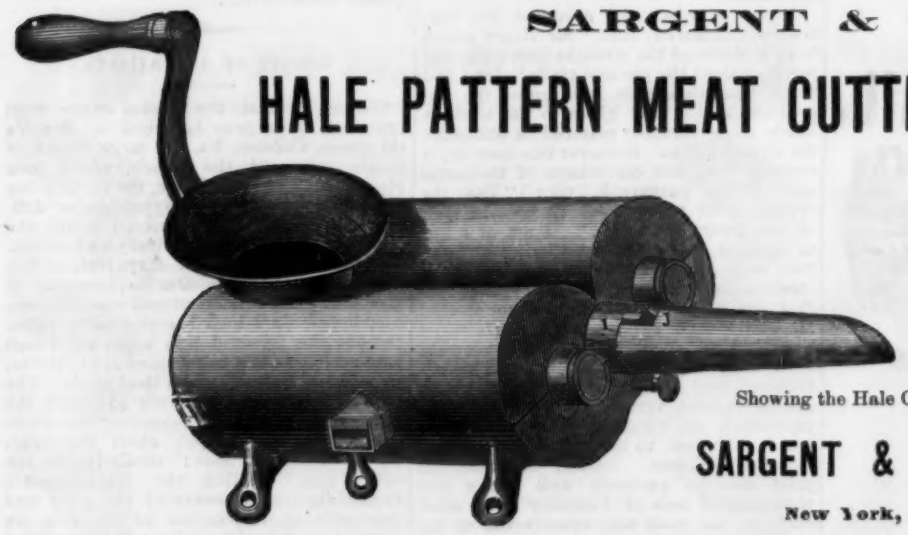

Works Rapidly,
Cuts without Tearing the Meat,
Easily Cleaned,
Self-Sharpening.

Showing the Hale Cutter Closed.

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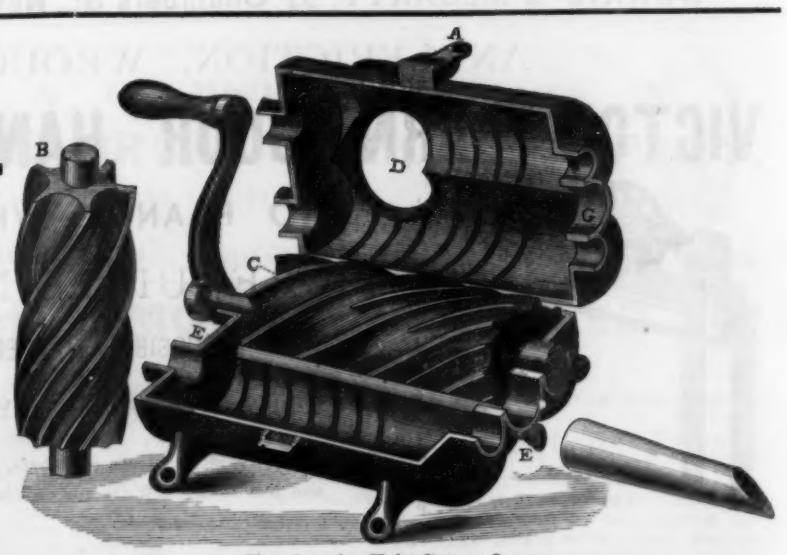

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Sargent's Patent Sausage Stuffers.

We have a good stock of all the above, and are prepared to fill orders promptly.

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Five Sizes, Nos. 1, 2, 3, 4 and 5.

We manufacture at our works in New Haven, Conn., a full line of Stebbins Gates, both of the "Stebbins Pattern" and the old "Original Genuine Stebbins," and are prepared to fill orders promptly for either kind.

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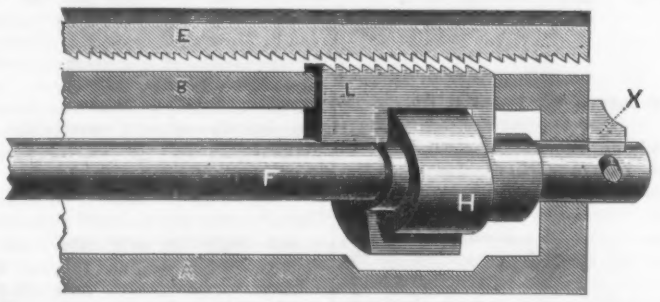
Massey's E & K Parallel Instantaneous-Grip Vises.

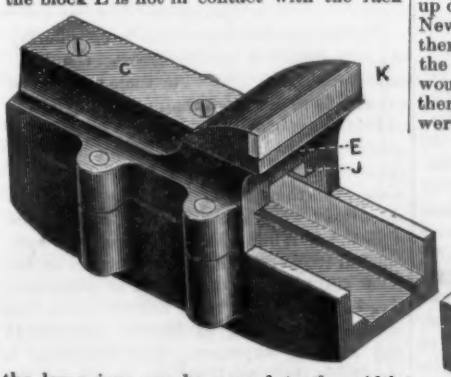
The sectional and perspective views represent this vise with all the principles of the screw, and the advantage of any size work gripped between the jaws with less than half a turn of the handle. For instance, a piece of work 1 inch thick can be gripped and released, and a ⅛-inch piece substituted and tightly gripped, without releasing the vise handle or turning it more than half a revo-



Parallel Instantaneous-Grip Vises.—Fig. 1.—Longitudinal Section, Showing Parts Out of Gear.

lution. The labor of moving the loose jaw in or out and gripping of work is done with one hand, leaving the other hand entirely free to handle the work. Where it is necessary to use both hands to hold the work the loose jaw can be pushed up with the body, when, by a slight motion of the body, the handle will drop in the direction of the arrow, Fig 2, the weight of the handle causing sufficient grip to hold work when the right hand is released to complete it.

Fig. 1 shows the parts out of gear. Fig. 2 represents the movable parts detached. F is the shaft on which is secured, at its front outer end, the hand-lever G, and near its opposite end the scroll or spiral cam H. On this cam rides a block or dog, L, provided with flanges which embrace the cam, and also a series of teeth which are adapted to fit into corresponding teeth in the long rack E that is imbedded in the cap piece C. On the under side of this cap piece a channel, J, is formed, which holds block L in position with the long rack E, keeping the teeth at all times parallel. By manipulating the hand lever G the spindle F with cam H can be caused to move the block L into or out of contact with the long rack E. When the block L is not in contact with the rack



the loose jaw can be moved to the width required to hold the work; then, by turning the handle G in the direction of the arrow, Fig. 2, the cam H will bring the block L into contact with the rack E, and owing to the spiral or scroll shape of the cam will draw the loose jaw B closer to the jaw N K, and consequently secure the work firmly between the jaws. In order to limit the throw of the hand-lever G, and consequent movement of spindle F, a stop, X, is placed on the end of bar B. The construction of block L and rack E is such that they always come into gear with each other, the scroll or spiral on the cam drawing the block L up the inclined side of the tooth as block L travels forward.

Fig. 3 shows a vise adapted to the wants of railroads and machine shops and iron and brass workers. Fig. 4 represents one specially designed for coach and wagon builders, while that shown in Fig. 5 is for carbuilders, carpenters and all kinds of woodworkers. The vises are made with all parts interchangeable, all working parts being of steel, and are manufactured by T. C. Massey, South Jefferson street, Chicago, the Link Belt Machinery Company, 81 John street, this city, being the Eastern agents.

Brustlein concludes, from a great number of observations, that iron and steel can be alloyed with nascent hydrogen at ordinary temperatures; that at a red heat this alloy is broken up, but that at the melting temperature of steel it may again be alloyed with hydrogen with more or less energy.

Wages in Australia.—A late Sidney paper gives the following as the rates of wages ruling in some of the principal trades: Building trades.—Carpenters, 9/ to 10/; joiners, 9/ to 10/; stonemasons, 10/ to 11/; stonemasons' laborers, 6/ to 8/; bricklayers, 12/; bricklayers' laborers 8/ to 9/; plasterers, 9/ to 11/; plasterers' laborers, 7/6 to 8/; plumbers, 11/ to 12/; gasfitters, 9/ to 11/; painters, 9/ to 10/; polishers, 8/ to 9/; sawmill hands, per hundred. These prices are for the day of eight hours. There is a full supply of labor in all branches. Iron trades.—The following rates are paid by the hour, the men working eight hours a day, with two breaks in summer and one in winter. Iron turners, 1/ to 1/5½; engine fitters, 1/ to 1/4; shipsmiths, 1/ to 1/6; blacksmiths, 1/ to 1/6; blacksmiths' strikers, 9d. to 10½d.; iron molders, 1/ to 1/4½; pattern-makers, 1/ to 1/5; boiler-makers, 1/2 to 1/4½; boiler-makers' assistants, 9¼d. to 10¼d.; youths, 8d. to 9d.; general laborers in iron works, 8¾d. to 9d.; engine drivers, 9d. to 11d.; furnacemen, 10d. to 1/4; dressers, 9d. to 11d.; laborers in fitting shops, 8½d. to 10½d. Country blacksmiths receive from £75 to £80 per annum, with rations or board. Brass and copper trade.—At per hour, the men working eight hours a day, with one break. Brass finishers, 1/ to 1/6; brass molders, 1/2 to 1/3; coppersmiths, 1/2 to 1/6. Tinsmiths, who work by the piece and the day and in different establishments, 10 hours a day, can earn £2. 8/ to £4 per week. Galvanized-iron workers, working eight hours per day, can earn from £2. 10/ to £3. 10/ per week; black-iron workers, working eight hours per day, can earn from £1. 10/ to £2. 2/ per week. This trade is rather dull, and will probably remain so till about November.

A Proposed White-Lead Pool.

It was believed at the time of the breaking up of the white-lead pool last June, says the New York *Independent Journal*, that further attempts to maintain a combination of the white-lead corroders of the country would be abandoned, and that henceforth there would be an open market until changes were brought about by reason of some corroders abandoning the business or the increasing consumption would reach the capacity of production of the works then in operation. Since then the competition for trade has been sharp and entirely unrestricted by any agreement or understanding as to territory or prices, and the natural consequence has been an unprofitable trade. Except for a few of the leading brands, corroders have been unable to realize more than cost for their product, and some, in order to keep their customers or secure new ones, have sold at a positive loss. This condition of affairs could not continue indefinitely, and, as it began to be realized that even those corroders who had been considered weak financially continued to manufacture and showed no signs of giving up and going out of the business, it was suggested that another effort should be made to unite the corroders and save the industry from the ruin that was staring quite a number in the face. To the credit of some of the larger and stronger concerns it should be said that they were the first to move in the matter, and that it was prompted fully as much to assist the smaller concerns as to prevent a continuance of the present unsatisfactory condition of the trade. A movement has been set on foot looking to the formation of a combination of corroders, but as yet no meeting has been held and no definite plan has been decided upon, except that prices are to be made uniform and to be limited to a minimum figure. Signatures to the proposition and to a call for a meeting are being obtained, and it is hoped that an organization will be completed at an early day.

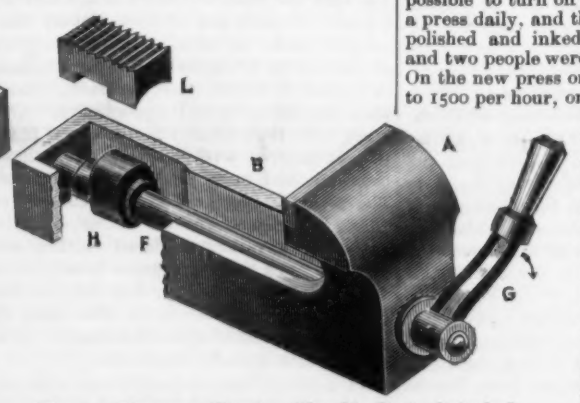


Fig. 2.—Diagram Showing Movable Parts Detached.

The advancing market for pig lead has made this move necessary and judicious at the present time. If, as asserted—and, we believe, truly—lead in oil has been sold at a loss, it is high time that some such course as has been inaugurated should receive the sanction of the corroders. There is no good reason why the business of corroding lead should be conducted without profit. The consumer does not, as a rule, receive the benefit of the extremely low prices that have prevailed, and, as the jobbers have made white lead a leader, there has been no profit to any one handling the article, except to the master painters, who have taken the full benefit of the low prices. With a combination of the corroders the chances for profit will be better, not only for corroders, but the jobbers will then be able to realize something for their labor, and the trade will be more satisfactory in every respect. We understand that it is the desire of the principal corroders to retain the better features of the agreement which existed under the old pool, and that such modifications are suggested as, it is hoped, will obviate the difficulties encountered under the old arrangement.

Rapid Steel-Plate Printing.

One of the last official acts of the late Secretary Folger was the signing of an order adopting a new system by which the steel-

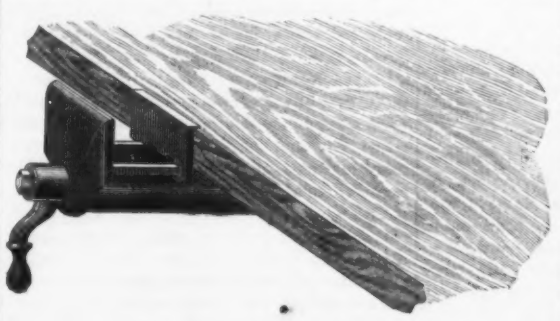


Fig. 5.—Carpenters' Vise.

engraved securities of the Government are executed on a steam rotary press. Results have been obtained by this press which it was thought impossible to accomplish, namely, the printing from a steel plate, curved on a cylinder, which is inked, wiped and polished automatically. Until this invention was perfected, after 60 years of experimenting, printing from steel-engraved plates was done on hand-presses. It was not possible to turn off more than 500 sheets on a press daily, and the plate had to be wiped, polished and inked after each impression, and two people were required to do the work. On the new press one man can work off 1200 to 1500 per hour, or 10,000 a day, the number being limited only by the skill of the feeder. It has just been adopted for the Bureau of Engraving and Printing of the Treasury Department, after three years' trial, although foreign Governments have used the same system for several years. The press, is now in use in the Government printing offices in Berlin, St. Petersburg and Stockholm. It has been necessary for protection to carry on experimenting and construction privately, and the first exhibition given was on the 9th inst., to members of the press, at the Homer Lee Bank Note Company's Works, Nos. 565 and 567 Broadway, New York, where it is now printing United States postal notes. The steel plate remains fixed in the press and forms a segment upon the surface of a cylinder, to which it clings and curves. The plate receives the ink from a series of rollers which it passes in its continuous revolution. Opposite this inking apparatus is the impression cylinder; extending over this is the blank sheet of paper, firmly held by grippers. Every third recover the plate arrives opposite it, and the pressure applied takes from the engraved lines of the steel plate the ink which has been deposited and left there after the surface has been polished by four ingeniously contrived pads that do the work as well as can be done by the hands of a skilled workman. Although the press weighs nearly 10 tons, it is so well balanced that it can be run by a ½-inch belt, or one-half the width of an ordinary sewing-machine belt, and at a cost, it is said, of only 2½ cents per day.

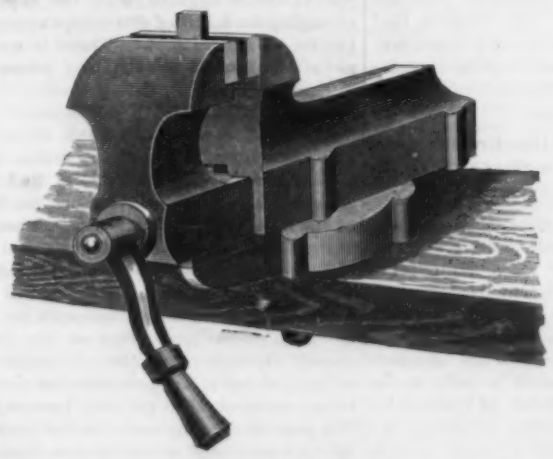


Fig. 3.—Machinists' Vise.

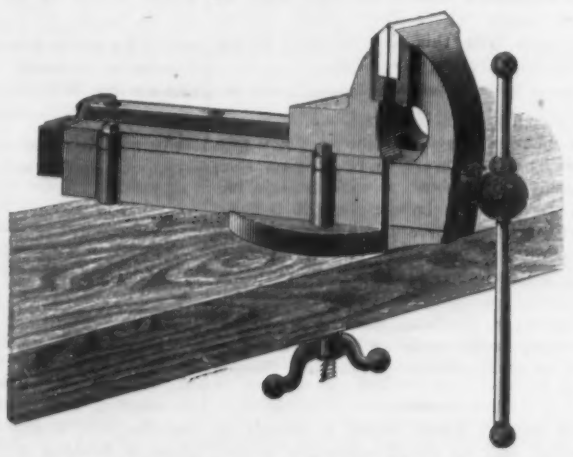


Fig. 4.—Carriage and Wagon Builders' Vise.

The Greatest Electrical Problem Unsolved.—Mr. Thomas A. Edison, having recently been asked what progress he was making toward obtaining electricity direct from the combustion of coal, instead of having to get it by first producing heat, then by heat steam-power, and finally electricity from the steam-power, said: "I have been working away at it for some months, and have got to the point where an apparently insurmountable obstacle confronts me. Working at the problem now seems to be very much like driving a ship straight for the face of a precipice, and when you come to grief picking yourself up and trying it again to-morrow. There is an opening in the barrier somewhere, and some lucky man will find it. I have got far enough to know that the thing is possible. I can get quite a current now directly from the combustion of fuel. Jablochkoff tried his hand at the same thing some years ago, and so did some Germans, but the results were laboratory curiosities only. I give myself five years to work at it, and shall think myself lucky if I succeed in that time. The unscientific world has no conception of what such a discovery would mean. It would put an end to boilers and steam engines; it would make power about one tenth as cheap as it is now; it would enable a steamship to cross the Atlantic at a nominal cost; it would enable every poor man to run his own carriage. It would revolutionize the industrial world."

New Steel Works in Belgium.

Out of a product of nearly 727,000 tons of pig and 503,000 tons of finished iron in 1882, Belgium only turned out 182,627 tons of steel ingots. Only four works produced the "metal of the future" last year, viz., those of the Société John Cockerill, the Société de la Fabrique de Fer d'Ougrée, and the Société de Thy-le-Château, all by the Bessemer process, and the Société d'Angleur by both the Bessemer and the Thomas processes. At the beginning of the present year new and extensive steel works were started in connection with the Athus blast furnaces, but the Société de Fabrique de Fer d'Ougrée have not yet erected a plant for working the basic process, although holding a license from the Angleur company, the sole *concessionnaire* for Belgium At the end of July last, some new steel works were started at La Louvière, in the district known as "Le Centre," about mid way between Mons and Charleroi, where there are a great many collieries and coke ovens, five blast furnaces, of which, however, only one is at present in blast, and a few rolling mills. The single furnace in blast is only separated from the new steel works by the Belgian State Railway, so that they are practically contiguous. It belongs to the Société Anonyme des Hauts Fourneaux et Fonderies de la Louvière, formerly Cambier et Compagnie, and is at present producing 50 tons of forge pig daily; but it is intended shortly to make Bessemer pig to supply the new steel works, either in this furnace or in the one adjoining, which is ready to be blown in as soon as the state of trade permits. The works adjoining were founded in 1850, for the manufacture of finished iron, by M. Boucqueau, who bequeathed them to his engineer, M. Boël, the present owner. This gentleman has lately added Bessemer steel works, for an eventual production of 80 to 100 tons of ingots per 12 hours, with new rolling mill, and also a wire mill in connection. There is only one pit, with two 7 ton converters, slightly converging, with the ordinary eccentric mouths. An Armstrong hydraulic lift raises the pig iron and spiegeleisen to the cupolas, of which there are two for pig and two for spiegel. Besides the central crane for casting, there are three ingot cranes, all worked by hydraulic power. A large double heating furnace is about 50 feet from the pit. The bottom of the furnace is slightly inclined, and there is a door at each end, so that the ingots are charged in at one end and taken out at the other. The furnace is thus continuous, and is capable of holding 18 tons. The grate is stepped, and only consumes 4 tons of coal per 12 hours, or 6 per cent. of the steel heated. A new three-high roll train has been put up for rails or billets, which are to be a speciality. The billets, which vary from 40 to 100 mm., or 1½ to 4 inches, are cut to length by powerful shears, the bars being fed up by live rollers. A small locomotive conveys the billets to the wire mill, where they are put in a furnace, on the same principle as that above mentioned, capable of heating as much as 30 tons in 12 hours. The wire mill, provided with the latest improvements, is considered the best arranged on the Continent. A compound and condensing engine of 500 horse-power, making 100 revolutions a minute, drives the roughing rolls at 250 revolutions, and the finishing rolls at 500, both by rope gearing. The previously-existing iron works, which will henceforth be used indifferently for steel and iron, are provided with the same system of heating furnaces with stepped grates. The four roll trains include a new one lately erected for fish plates and small colliery rails, this department being capable of producing 1200 tons a month, in addition to over 100 tons of bolts and rivets. There is, besides, a shop for turning out horseshoes perfectly finished by means of a machine invented by M. Boël, to the extent of 100 tons monthly, and it is proposed shortly to make them of mild steel instead of iron, as also rivets. These works have been erected, not so much for rolling rails, but for producing extra mild steel that shall supersede iron for ordinary purposes, and especially fine-grained iron; for turning out small steel instead of iron rails for collieries and sugar-houses, and besides keeping the wire mill going, for supplying steel billets to Charleroi and for export. The works will probably give employment to 1000 hands when all the departments are working.

The Ide Feed-Water Heater and Purifier.

The principal objection urged against some of the feed-water heaters now in the market is the difficulty of removing the sediment which is deposited in the course of time. This forms a coating on the inner shell and upon the tubes, and lodges around and between the latter, and in the absence of suitable provisions for removal a few months' use will often suffice to make the heater practically useless. The Ide feed-water heater and purifier is designed and constructed to overcome this difficulty. Fig. 1 represents the heater complete. Fig. 2 shows the bolts removed and the shell elevated, giving free access to all the tubes for cleaning. The space around the tubes can be cleaned and washed out and all loose sediment or scales removed. The two side openings are for the exhaust steam to enter and escape. Fig. 2 also shows the interior construction. The heating surface is composed of free-end tubes closed at the top end and screwed into a plate of metal which is held between the flanges. The base of the heater is cast with a division-plate between the inlet and outlet openings. Open end tubes are screwed into this plate and extend up inside of the larger tubes. The steam entering below the division-plate is forced up the inside tube, and, passing out at the upper end, descends down the larger tubes and out at the upper side opening. With this arrangement all tubes are free at one end, and the joints are not strained by unequal expansion of the tubes. By removing the bolts the outer shell can be taken off, giving free access to all the tubes, and all the tubes can be unscrewed and taken out to remove scale if desired. Four hand-holes are, moreover, placed in each heater, so that cleaning may be effected occasionally without taking the heater apart A steam pump or injector can be used for feeding the boiler in connection with the heater, the cold water being forced into the heater just above the flange joint, and the hot, purified water passing out of a pipe near the top of the heater into the boiler. By this arrangement the pump works cold water. The heater is made by Mr. A. L. Ide, of Springfield, Ill.

Fig. 1.—General View.

Fig. 2.—Heater with Shell Elevated, Showing Facility for Cleaning.

THE IDE FEED-WATER HEATER AND PURIFIER.

The firm of Weightman & Wolff, consulting engineers, 85 Astor House, New York, has been dissolved by mutual consent, Mr. Weightman retiring. Mr. Wolff, who is associate editor of the *American Engineer*, can be found by his clients at the office formerly occupied by the firm.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, October 16, 1884.

DAVID WILLIAMS, *Publisher and Proprietor.*
JAMES C. BAYLES, *Editor.*
JOHN S. KING, *Business Manager.*

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National Commercial Statistics for the Fiscal Year 1884.

Hon. Joseph Nimmo, Jr., chief of the National Bureau of Statistics, has just issued his annual report on the foreign commerce of the United States for the fiscal year ended June 30, 1884. This report is of very great interest and value, containing much information of commercial importance in addition to the usual tables of imports and exports. The total value of the imports and exports of merchandise during the year amounted to $1,408,211,302, as against $1,547,020,316 during the preceding fiscal year, showing a decrease of $138,809,014. The exports of domestic merchandise decreased $79,258,780, while the imports of merchandise decreased $55,483,221. The excess of the value of exports over imports during the year was $72,815,916, against an excess of $100,648,488 during the preceding fiscal year, but in making this comparison it must be remembered that the customs valuation of imported goods was reduced by the late tariff act, which provided that transportation, packing charges, &c., should not be included in the dutiable value, thus causing the imports of the last fiscal year to be, it is estimated, about 5 per cent. below their value when reckoned upon the same basis as the imports in the fiscal year 1883. The real balance of trade in our favor for the fiscal year 1884 was, therefore, only about $39,000,000. The exports of specie during the year amounted to $67,133,383, against $31,820,333 in the previous fiscal year, and the imports were $37,426,262, against $28,489,391. The excess of specie exported was $29,707,121, against an excess of $3,330,942 exported in the fiscal year 1883. The following table shows the total movement of merchandise and specie for the past five fiscal years:

Merchandise.

ending June 30.	Exports.	Imports.	Excess of exports.
1880....	$835,638,658	$667,954,746	$167,683,912
1881....	902,377,346	642,664,628	259,712,718
1882....	750,542,257	724,639,574	25,902,683
1883....	823,839,402	723,180,914	100,658,488
1884....	740,513,609	667,697,693	72,815,916

Specie.

1880....	$17,142,919	$93,034,310	*$75,891,391
1881....	19,406,847	110,575,497	*91,168,650
1882....	49,417,479	42,472,390	6,945,089
1883....	31,820,333	28,489,391	3,330,942
1884....	67,133,383	37,426,262	29,707,121

* Excess of imports of specie.

According to the statistics of the production of gold and silver published by the Director of the Mint, the United States mines yielded $926,513,792 in the last 12 years, and, as the net exports during the same time amounted to $110,035,368, the production exceeded the net exports by $816,478,424.

During the fiscal year 1884 the total value of exports of agricultural products was 73 98 per cent. of the entire merchandise exports, the exports of domestic manufacture were 15.35 per cent., the products of mining were 7.84 per cent., the products of the forest were 1.31 per cent, and the fishery and other products were 1.52 per cent. In the 12 fiscal years mentioned below the products of manufacture have borne the following relation to the total value of domestic exports:

Years.	Per cent.	Years.	Per cent.
1860	14.43	1879	12.74
1870	10.53	1880	9.65
1875.?	13.55	1881	10.10
1876	13.68	1882	14.08
1877	13.91	1883	12.91
1878	13.14	1884	15.35

This table shows that, though our exports of manufactured products constitute a very small part of our total exports, they were larger in 1884 than for many years previous, which is a gratifying fact. The exports of iron and steel in 1884 constituted 3.02 per cent. of the total domestic exports, and amounted in value to $21,909,881, being considerably above the value of the exports of any other branch of manufacture. In the same year the imports of iron and steel amounted to $41,464,599, which was 6.21 per cent. of the total value of imports of merchandise, being only exceeded in manufactured products by wool and silk, embracing, of course, the raw material with manufactures. The following table exhibits the details of the imports of iron and steel in the fiscal years 1884 and 1883, by values only, the blanks in the column for 1883 indicating that the values were not kept separately for that year, but were included in "all other":

Articles.	1884.	1883.
Iron ore	$1,317,546	$1,580,597
Pig iron	4,932,598	7,944,982
Scrap iron	653,105	1,240,490
Scrap steel	142,937	.....
Bar iron	1,742,066	2,409,948
Iron rails	17,749	155,946
Steel rails	234,697	3,678,794
Hoop iron	8,296	205,955
Sheet and plate iron	684,668	751,206
Tin plates	18,182,637	17,699,239
Cutlery	1,917,900	2,113,065
Firearms	1,355,335	1,473,225
Machinery	1,231,843	2,228,732
Cotton ties	527,179	.....
Steel hoops, sheets and plates	169,223	.....
Steel blooms and bars	1,457,187	.....
Wire rods	3,848,322	.....
Wire and wire rope	462,781	.....
Anvils, axles and forgings	136,674	.....
Chains	109,214	.....
Files	40,810	.....
Needles	271,936	.....
All other	2,419,916	18,613,664
Total	$41,464,599	$60,081,843

This table shows a very heavy reduction, amounting to about 31 per cent., in the imports of iron and steel in 1884, as compared with 1883, the reduction embracing every item as far as can be ascertained except tin plates, which continue to be imported in increasing quantities at an increasing total outlay, notwithstanding the depression in trade generally. The details of this table are worthy of more extended comment than our space permits at present. We append another table giving the tonnage of the iron and steel imported as far as can be ascertained, the missing items for 1883 not having been collected by the Bureau of Statistics until the passage of the late tariff act:

Articles.	1884. Gross tons.	1883. Gross tons.
Iron ore	553,806	607,176
Pig iron	289,172	433,602
Scrap iron	46,506	70,964
Scrap steel	8,060	.....
Bar iron	38,586	52,174
Iron rails	557	5,236
Steel rails	7,384	112,837
Hoop iron	143	5,947
Cotton ties	15,656	.....
Sheet and plate iron	8,244	10,488
Tin plates	220,739	216,133
Steel hoops, sheets and plates	1,753	.....
Steel blooms and bars	22,432	.....
Wire rods	86,510	.....
Wire and wire rope	3,185	.....
Anvils, axes and forgings	1,090	.....
Chains	1,075	.....

The shrinkage in importations of iron and steel is here shown to be very great, comparisons by tons being more striking than by values. This shrinkage still continues, and when the returns of the current fiscal year are made up they will, from present appearances, show a much smaller quantity of iron and steel imported than even in the fiscal year 1884.

Considerable attention is paid to the subject of duties in the report, also to the shipping interest, immigration, freight charges and the relation of foreign commerce to internal commerce and transportatation. Much space is devoted to the discussion of the enormous magnitude of our internal commerce. It is shown that the value of the products of the various industries of the United States is seven times the total value of our foreign commerce, nearly three times the total value of the foreign commerce of Great Britain and Ireland, and five times the total value of the foreign commerce of France, including in each case both imports and exports. The total value of the products of industry in the United States is also shown to be a little more than twice the total value of the exports of merchandise from all the countries of Europe. The United States is now the largest manufacturing country on the globe.

The Fuel Question.

It will be remembered that some time ago we made reference to the condition of the coal trade, and showed from Philadelphia testimony how the miners and shippers of anthracite and bituminous coal discriminated against manufacturers whose works were located not far from the mines, in favor of other consumers of coal whose establishments were much further away. A very striking instance of this discrimination has come to our notice during the past week. We learn that bituminous coal is being laid down at points along the seaboard, in this vicinity, 25 cents a ton cheaper than at inland points on the line of the same railroad. Manufacturers whose establishments are located at least 90 miles further from the mines than their inland competitors are enabled to get their fuel at a difference in rates which amounts to quite a profit on manufactured goods at this time of very close competition. It is remarked by those who are conversant with the circumstances that the cause of the low prices along the seaboard is the competition of Nova Scotia coal; but if the foreign coal compels the shipper of domestic coal to reduce his prices along the seaboard, he ought, in justice to his customers, make the same reduction at points in the interior; in other words, if he chooses to reduce the price of his goods to a point that will give him a large part of the seaboard trade, he should make that price govern interior transactions also. Discrimination is not only an injustice to interior manufacturers, but it is also an injury to the railroad companies themselves which haul the coal. The markets for many of the goods manufactured at interior points are in the great cities along the seaboard, and the companies which haul the coal obtain the benefit of the freight on these goods manufactured along their line; yet if they furnish coal to rival establishments at terminal points cheaper than to establishments along their line, they are simply disposing of a small amount of their carrying capacity, as against a much larger amount which they ought to employ.

It is remarked by a Pittsburgh paper that "one of the results of the use of "natural gas most earnestly and reasonably to be hoped for is that the superiority "of that fuel and its low cost may bring "to the city many of the lighter manufacturing industries, such as now abound "in New Jersey and New England." This statement might be paraphrased in regard to points along the line of railroads in Pennsylvania, Southern and Western New York, Western New Jersey and other localities not far from the coal mines. It is an anomaly that manufacturing establishments in New England should secure cheaper coal than those located near the mines. This condition of affairs is not to be changed by advancing the price of coal to New England establishments. They are entitled to get their fuel at as low cost as possible, but the injustice which interior manufacturers complain of is, we think, a serious grievance. There are many points in the interior at which manufactures could be extensively built up if fuel were furnished them at a reasonable rate, but no price seems reasonable to a man located along the line of a railroad if higher than the price realized for that coal at the terminus of the road, possibly 100 miles further on.

We do not write in the interest of any particular section, but argue for the best interests of all sections, as we think this discrimination against local consumers is a general one, and is not characteristic of any special locality. Distant markets seem to be the *ignis fatuus* pursued by railroad managers and coal miners. They do not give the attention they should to the building up of line and near-by trade. All our great coal roads should be lined with manufactories from one end to the other, like beads upon a string, whereas the truth is that there are long stretches of eligible locations for manufacturing establishments that are not now being utilized, simply because capitalists find it best to locate at distant points where they obtain special advantages from this peculiar policy of the mining and carrying companies.

France may consider herself well indemnified for her expenses in China if she is permitted by other powers to retain possession of Keelung. To obtain a naval station has from the first, we have reason to believe, been a grand objective point in her Asiatic movements, as well as to tap the trade of China somewhere on the southern border, which she accomplishes at Tonquin. The coal mines of Keelung, which the Chinese have temporarily made useless by flooding, ought to go far toward satisfying French ambition.

Our English letter, which is always interesting, will be found unusually so this week. Our correspondent advises us of the existence of an almost general conviction in England that the bottom has been reached, and that prices are now likely to mend rather than retrograde. Although there has been only a slight spurt in buying for the home market, and there is but little improvement in the external demand, some hopeful results have been accomplished in the direction of higher prices. Some grades of pig iron, sheet iron, galvanized iron and other articles are appreciably higher than they were a fortnight prior to the time at which he wrote, his letter being dated September 29. This would indicate that a reaction had set in against the decline in prices. The process of crowding out weak establishments has been going on quietly for some time, he says, and has at length produced an effect upon the course of business. This depletion has been accomplished with very few failures and but slight disturbance to business. Our correspondent's remarks upon the Chester meeting of the Iron and Steel Institute will be found very pleasant reading, as will also his reference to the growing strength of the fair trade movement in Great Britain.

Commerce on the Pacific.

Our trade on the Pacific coast steadily maintains its proportions, forming the foundation of what must ultimately become a lucrative commerce of a magnitude not easily conceived. This remark holds true not only of our coastwise connections on the Pacific, but in the relations which are being established with Asiatic nations, Australia and the islands of Polynesia. San Francisco is the central port, and expects to hold its prominence, whatever degree of success may be realized by other Pacific rivals, and however grand the destiny of Port Moody, which the Dominion hopes to build up at the western terminus of the Canadian Pacific Railroad, when steamships shall depart thence regularly for Yokohoma, in Japan. The exports from San Francisco for the first six months of 1884 have just been published in detail, exhibiting a total valuation of between $15,000,000 and $20,000,000. Ireland leads off among the points of destination, taking nearly $5,500,000 of products, principally wheat and flour. England took a little over $2,250,000, half of this amount in breadstuffs. The Hawaiian Islands are next in order, taking out a large variety of merchandise valued at about $1,290,000. China also ranks among the millions, her custom for the period named amounting to $1,063,760. Among the items are cartridges and arms valued at $15,500, flour to the value of $500,000, and large quantities of manufactured cotton. Mexico takes very freely of metals, including iron, steel and quicksilver, also machinery to the value of $150,000. Her total is $800,000. Australia, British Columbia and Central America rank nearly the same, with an average of about $600,000, the first mentioned taking heavily of salmon, while the exports to Central America are one-half flour, and those to British Columbia are of almost every conceivable kind. In taking a general survey of our Pacific trade we may easily imagine, in regard to China, that the United States have missed a grand opportunity. Our trade with that country is the merest bagatelle, compared with what it might have been if it had been properly looked after. The friendly overtures to that country of which Burlingame was the bearer, and the exclusive advantages placed within our reach through the Burlingame Treaty, were wantonly thrown away. The folly of this course is forcibly shown by Hon. Geo. F. Seward, late United States Minister to Pekin, who says, in a recent interview:

It is to me one of the deplorable facts attending an illiberal treatment of the Chinese in this country that our Government has abdicated in China its position of influence and strength. The Chinese in earlier days sought our counsel in all serious matters. It is not too much to say that our advice was given in the interest of peace and progress—fairly to them and fairly so far as all others were concerned. Our anti-Chinese treaty and legislation have destroyed the old faith which the Chinese reposed in us, and have left us unable, as between the foreign powers, to sustain the old position, which was essentially that of a friendly arbitrator of differences. I have always thought that good policy demands from us the maintenance of a position of influence in China. There is a great field there upon which to win peaceful triumphs. The Chinese want railways and telegraphs; they want to have their great mines of coal and iron opened and worked; they want to move along the channels of peaceful progress and take a higher position, industrially as well as politically. It should have been our mission—and in the better days it appeared to be our mission—to sustain and support them in their efforts to work out their proper destiny.

Through all the regions laved by the waters of the Pacific, commerce stretches out its hands to grasp the rewards that enterprise makes possible to every American. Blundering diplomacy and ill-advised legislation are the chief impediments.

Autumn Meeting of the British Iron and Steel Institute.

The British Iron and Steel Institute held their autumn meeting this year at Chester, on Tuesday, September 23, and the three days following. The original intention was to hold the meeting at Sheffield, but, owing to many of the large Sheffield steel-makers refusing to open their works to the members of the Institute, because, it is said, of the presence of a large number of Continental metallurgists, it was decided to change the place of meeting to Chester, which, though not an iron or steel center, is yet a very picturesque and interesting city, and within easy reach of many of the largest works in England. The proceedings were opened by addresses of welcome from the Mayor of Chester, the Lord Bishop and the Dean. After the usual routine business, Sir B. Samuelson, president of the Institute, nominated as his successor Dr. Percy, who was elected unanimously. The president next, in a few brief remarks, informed the meeting that the Institute continued in a most prosperous condition; that its members, including those proposed for election at the current meeting, numbered about 1400, and that it fully maintained its international character, as was shown by its constantly increasing foreign membership. A paper was then read by Mr. Aubrey Strahan on the geology of Cheshire, followed by one on the manufacture of crucible steel by Mr. Henry Seebohm, which latter paper gave rise to considerable discussion. In the afternoon the members visited the country seats of Mr. Gladstone and the Duke of Westminster. On Wednesday papers were read by Messrs. Siemens, Riley and Dick, at the conclusion of which the members inspected the London and North Western Railway Company's Works at Crewe. On Thursday the papers of the day before were discussed, as well as two others read by Mr. Watson Smith and Dr. Otto on the recovery of by-products from coke ovens. The afternoon was occupied by an excursion to the neigboring salt mines and works. Friday, the 26th ult., and the last day of the meeting, was devoted to an excursion into North Wales, where, among other things, the Menai suspension and Britannia tubular bridges were examined. Elsewhere in this issue we publish part of Mr. Seebohm's paper on crucible steel, which has already created considerable discussion in England. The point at issue which has attracted so much attention has reference to the future of the crucible-steel industry, Mr. Seebohm evidently believing that the finer grades of steel will never be made by the Bessemer or any of the kindred cheaper processes, and that there will always be a demand for crucible steel. In defense of the pneumatic process Sir Henry Bessemer has written a letter, which we print this week, stating that Bessemer steel has not only supplanted puddled iron in great measure, but is even now taking the place of crucible steel to a considerable extent in Sheffield. In reply, Mr. Seebohm states it has only supplanted the commoner kinds of crucible steel. This controversy, started by Mr. Seebohm's paper, will at least draw attention to the constantly increasing use of Bessemer steel, even if it fails to definitely settle the question.

Transcontinental Routes.

The Dominion Government is considering the expediency of wholly freeing the Welland Canal from tolls. For some reason the canal fails to get more than a meager share of business, notwithstanding the large sums recently expended in its enlargement. One reason assigned is the insufficient depth of water, but the competition of the Erie Canal since tolls were abolished may explain the difficulty. While this may be true, we cannot fail to observe that vessel owners on the lakes also complain of the lack of remunerative business, there being neither grain, ore nor lumber offering as freight sufficient to pay running expenses. The conclusion is inevitable that canals are no match for the steam horse. Will Transcontinental trade hereafter, when prosperous times return, seek the Canadian route in preference to any other? Will there be an important diversion of trade from existing routes when the Canadian Pacific Railroad is finished, say one year from to-day? Our friends to the north of us answer these questions most positively in the affirmative, and are so confident of realizing their radiant dream that they are expending millions of dollars in the remote wilderness, fully believing that there will be golden returns. One of our Montreal contemporaries says:

At present all the trade which crosses the Pacific from China and Japan goes to San Francisco, and thence to New York by the Central and Union Pacific railways. Now it is worthy of note that the distance from Port Moody (the Western terminus) to New York by the Canadian Pacific Railway via Brockville is only 3127 miles, while from San Francisco to New York by the shortest railway line through the United States it is 3331 miles, a difference of 204 miles in favor of the Canadian Pacific.

A still more important advantage claimed is a saving of 810 miles in the route from New York to Yokohama via Port Moody, compared with the San Francisco route. The president of the Canadian Pacific Railroad is now in England, with the object of arranging for a line of steamships across the Pacific to Asiatic ports. There is no suspicion that such a scheme may prove chimerical.

All of our readers who have visited St. Louis will remember that the trains, after arriving on the Missouri side of the river, enter a tunnel which passes under the heart of the city, and finally land the passengers in the Union Depot. When the tunnel was planned it was made to pass close to the site of the new post-office building, and the project was to switch the mail cars into the basement of the post office as the trains passed through, and thus facilitate the delivery of mails. The post office has recently been completed, but up to the present time this plan of the engineers has not been put into operation, and several serious objections to it have been raised. One difficulty is the annoyance from the smoke and gases of the tunnel locomotives. We are informed that the postal authorities are at present engaged in the attempt to devise some means of receiving and delivering the mails from and to the railway trains as they pass through the tunnel which shall be at once expeditious and at the same time free from objections. The problem is an important one, and its solution will be watched with interest by engineers all over the country. The introduction of a smokeless locomotive for propelling cars through the tunnel would per-

haps solve the difficulty, but a successful smokeless locomotive for burning bituminous coal has not yet been produced.

Reducing the Cost of Production.

The constant aim of all manufacturers is to reduce the cost of production. An examination of the published list of prices in almost every line of manufacture shows a continuous, though unequal, decline in the selling price of goods. Take the price of iron for the last 50 years. While there have been important and often sharp fluctuations in price during that time, it will be noticed that there has been, on the average, a constant decline. When a boom comes prices go up, and when depression comes they fall, but the high-water mark of each rise is lower than that of the preceding one, while the decline also finds a lower level than that which preceded it. The total result has been a reduction of from 30 to 70 per cent. in the selling price of most manufactured articles within the past 50 years. To meet this reduction in price there must be a reduction in cost. This can be reached in one of four ways: First, by reduced wages; second, by reduced profits; third, by reduced cost of material, and, fourth, by improved methods and processes.

First, as to wages. Experience in most lines of manufacturing shows that no reduction in the average rate of wages in a series of years has been or can be made—indeed, it is a question if it is advisable it should be made. Take iron as an example. Wages to-day at Pittsburgh are much in excess of what they were 25 years ago. The minimum rate of wages paid in the Pittsburgh iron works is very much above the minimum that has been paid even in times of depression, such as those following 1857. The reason for this is that labor, supplemented by machinery, has become steadily more productive; but if we look closer we find that, while wages have advanced, the cost of labor, measured by the value of its products, has in a marked degree declined. It is in this direction that further economy must be sought, and not in lower wages. The more productive labor becomes the less it costs, even though paid at higher rates than it commanded when less productive. We believe that the tendency of wages all over the world is to advance. Some have asserted that American wages will have to come down in order to meet the competition with the lower wages paid in Great Britain. We believe however, that the tendency is toward equalization, and that in the matter of cheap labor no country can claim a permanent advantage over any other country. It is therefore safe, in this discussion, to dismiss reduction of wages as an element in the reduction of cost of production.

Second, as to reduced profits. The measure of profits in manufacturing through a series of years is roughly indicated by the prevailing rate of interest. If the profits of manufacturing, reference being had to the risk, are somewhat in excess of the prevailing rates on money, capital will seek permanent investment in manufactures, the amount of ready money will be reduced and interest rates will advance. It is also true that a great deal of the money invested and employed in manufacturing is borrowed money, and the rates of interest at which this is borrowed depend somewhat on the profits of the manufacture. Indeed, it needs no argument to show that rates of interest and profits in manufacturing are closely related. The rate of interest in this country has been greatly reduced within the past 10 or 15 years. Just prior to 1873, 9, 10 and even 18 per cent. were no uncommon rates for manufacturers to pay for money. Paper that was regarded as "gilt-edged" at some of our manufacturing centers was discounted at as high as 18 per cent. Money loaned on mortgage brought 10 to 12 per cent. Our best savings banks paid 6 per cent. on deposits. Now money can be obtained on good paper at 6 per cent., on mortgage at 5 to 7 per cent., while our savings banks pay from 3 to 4 per cent. This all indicates that in the general reduction of the cost of production capital has borne some share.

As to reduction in cost of materials and improved processes and methods of manufacture, it is chiefly in the reduction of cost of materials and the greater efficiency of labor that grows out of improved processes and methods of manufacture that we look for reduction of cost of production. No one can compare, for example, the rolling mills or the furnaces of to-day with those of 25 years ago without being struck at once with the great improvements that have been made in plant and processes within that time, and if he is at all acquainted with the items of cost for the two periods he will at once understand how these have been reduced. In addition to the improvements in the old plants, new processes have come into use, the Bessemer being a notable example. Another example of improved processes is the introduction of the regenerative furnace and the enormous saving of fuel that has resulted therefrom. The indications, indeed, are that a most important source of economy in manufacturing processes in the near future will be the substitution of gas for solid fuel, and the utilization of a much larger proportion of the heat units contained in fuel than is possible under the present methods. There is not much reason to hope for great and revolutionary economies. They have been sought along every path open to investigators in all departments of science, and not only have they not been found, but there have been no indications that they exist as possibilities for the present generation, at least. There is, however, room for an important progress in little things of vast importance in the aggregate. The most promising employment for the progressive manufacturer at this moment seems to be in going over ground already traversed and tying up the loose ends of manufacturing processes. Minor economies overlooked in more prosperous times are now forced upon the attention of manufacturers; and if these are as carefully looked after as they should be, the progress of the next few years will be as satisfactory and as permanently beneficial as we could wish, even though no great and startling discovery is recorded which shall mark the beginning of a new era of manufacturing development.

The project for the restriction of steel-rail production, the prospects of which seemed quite flattering last week, has very probably come to naught. One of the companies would not agree to the proposition to run half-time, or on day turn only, during the first six months of 1885, for the reason that its contracts for deliveries of rails would be seriously interfered with, and arrangements had already been made for the receipt of the necessary materials. As the agreement of all the companies whose works are now in operation was essential to the success of the plan, this objection was fatal. The prospects now are that the companies will run their works to suit their individual conditions or necessities, either single or double turn, and that a few months hence, if business does not revive in the mean time, there will be another fierce competition for orders, with the possibility of some works stopping. Some large orders are now about to be placed by Eastern railroad companies which have been expected to come upon the market for some time, and, as they are regarded in the nature of options, it is very probable that they will be taken at the low rates prevailing some time ago, or about $27 at mill. It is claimed by the steel-rail companies that strictly new business will not enjoy these favorable rates, but will only be taken at the enhanced prices which they are now in better position to demand than they were a short time ago.

May 1, 1886, will be an important date in the labor annals of this country if the federation of trades and labor unions have their way. They met at Chicago last week and firmly settled upon the above-named date for putting into effect by all trades and branches of labor the eight-hour system throughout the United States and Canada. They believe it is useless to wait for legislation, but that the desired result of shorter hours for labor is only to be attained by thorough organization among workmen. This is 18 months' notice to employers, who will thus be given ample time to make preparations for the great labor reform of the century. It must be admitted, however, that the convention displayed great self-control in not naming a much earlier day for the realization of their hopes and struggles.

Steadying Ships at Sea.

To the Editor of The Iron Age: Ships roll and pitch terribly in a heavy sea, drift to leeward and sometimes capsize in a squall. This could be measurably prevented by steel plates let into the keel horizontally on both sides from stem to stern. Construct the keel, whether of wood, iron or steel, suitably so as to let in steel slots, 4 or 5 inches deep, securely on both sides 1 or 2 feet above the bottom of the keel, more or less, according to size of ship. Then drive into these slots steel plates from 3 to 5 feet wide, more or less, according to size of ship, the whole length, the outside forward corner of the plates to be sloped off, so that both, when in place, will be sharp forward, like the ship. The plates may be ½ inch thick uniform, or, if there was danger of their breaking off at the slot from heavy rolling and pitching of the ship, then roll them thicker at the edge next the keel, and thinner at the outer edge, though, as they would spring with the pressure, this would prevent them from breaking, or breaking off the keel. They could also be rolled with double flanges and be countersunk into the keel. These plates, being deeply submerged, when the ship was pressed on one side by wind and waves would lift up on the mass of water on one side and press down on the other, and thus to a great degree prevent rolling, and the same action would prevent pitching to a great extent, while the plates would also prevent sailing ships more especially from drifting to leward. A sailing ship with these plates could also dispense with half the ballast. A large steamship with these plates would plow through the waves with very much less pitching and rolling, a great advantage, especially to passenger steamers, making the ocean voyage much more pleasant and preventing sea-sickness. And in case of large, narrow, long steamers, perhaps, in place of putting in the plates the whole length of the keel, a section of one-quarter the length at the bow, and the same at the stern, would answer every purpose.

The displacement of the plates in running through the water would be small, while the friction would be trifling, and, as the ship would pitch less, it would travel more direct and more rapidly, which would more than compensate. The plates could be rolled of very long lengths, to make few or no joints, and more especially when put in in sections at the bow and stern, and perhaps a third section in the middle, all being made sharp forward. This improvement is applicable to all kinds and sizes of ocean ships, sail or steam. What say steamship companies, nautical men, shipbuilders, shipowners, steel rolling mills and practical mechanics to this improvement? Certainly some new device is greatly needed to prevent ships from pitching and rolling in a heavy sea, and it is believed that this is scientific and practical, and would prove entirely successful.

AUGUSTUS WATSON, C. E.

WASHINGTON, D. C., October 12, 1884.

The Dangerous Friction Match.

We have received another communication on this subject, this time from Mr. J. B. Wayne, of the Fulton Iron and Engine Works, Detroit, Mich. Mr. Wayne's experience shows the danger of using ordinary friction matches in a very strong light—the light of a burning dwelling-house saved from destruction by a thoughtful housekeeper. His letter is as follows:

DETROIT, MICH., October 10, 1884.

To the Editor of The Iron Age: I nctice an article in your issue of October 2, headed "The Dangerous Friction Match," which reminds me of an experience I have had in that direction. The walls of the laundry of my house are wainscoted with pine; the sills of the swinging windows are made with a joint in the woodwork in the center of same, and the opening by shrinkage became wide enough to admit a lucifer match to fall in between the brick wall and wainscoting. One day smoke as from burning wood began to fill the house. My housekeeper's attention was directed to the volume of smoke issuing from these openings, and she divined the cause. Matches had been left on the sill nearest the flight of steps descending from the kitchen into the laundry, and one or more had evidently fallen through the crack and been carried by rats or mice to nests between the brick wall and wood wainscoting, and nibbling the match had set fire to shavings between the wall and wainscoting. A quantity of water was poured into the openings and the fire was extinguished. In the absence of this level-headed, thoughtful woman the house would undoubtedly have been burned, and another "mysterious fire" added to the already large list.

I am confident of the cause of this incipient fire, as in the adjoining house (double), built nine years before the fire referred to, the wainscoting (of pine) had decayed so that rats had eaten through. In stripping it off to replace with brick wall I found a very large amount of combustible material which could not have gotten there but by rats, such as rags, shavings and rubbish suitable to build nests with. No more wooden wainscoting for me, and I prefer the safety match hereafter.

J. B. WAYNE.

We have also received the following communication on this subject:

WASHINGTON, D. C., October 13, 1884.

To the Editor of The Iron Age: I notice the remarks of Mr. Steele in reference to my omission to mention friction matches as one of the prolific causes of fires. My object was mainly to impart information with reference to spontaneous combustion as a cause of fires. All the rest was incidental. A list of all the causes would include many not even hinted at. I agree fully with all he says about the danger of matches, and can reinforce his remarks by numerous cases of fires caused by children playing with matches. At least two such cases have occurred here during the present season. I recall an instance which occurred in Central New York some years ago, in which a couple of children on the adjoining farm took matches from a box hanging on the wall, went out to the barn where the men were running a thresher, and set fire to a stack of wheat standing near the door (there being more than could be stored in the buildings) and burned the stack, the barn full of grain, the thresher and an adjoining carriage-house with two carriages, harness, &c., all in broad daylight.

I presume it is safe to say there is scarcely a day in which a fire is not caused somewhere in the country by means of friction matches. It would certainly be a good thing if the law could be so changed as to forbid the use of any but the safety match, but I fear it will be a long time, if ever, before it is done. W. C. DODGE.

WASHINGTON NEWS.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., October 14, 1884.

Acting Commissioner of Patents Dryenforth, speaking of the new trade-mark law, said to the correspondent of *The Iron Age:* "The trade-mark law, as is known, was declared unconstitutional by the Supreme Court of the United States in the celebrated case of the United States *vs.* Steffens, upon the ground that the clause in the Constitution upon which only such a law could be founded was for the regulation of commerce between States and foreign nations, and that a trade-mark could only be registered if it were proven that it was to be used in such trade with foreign nations, with Indian tribes or between States. As the old law did not meet these requirements, it became necessary to enact the law of 1881. This law rendered it necessary for an applicant for registration of a trade-mark to state that the article is to be used in commerce with foreign nations or Indian tribes. The law is not as broad as the decision or the clause in the Constitution would warrant, since it will not cover mere inter-State commerce. In consequence, certain parties have been attempting to avail themselves of a supposed chance to appropriate the well-established trade-marks of others by applying for a register of such trade-marks, supposing that the Patent Office would take no notice of the old law. These people evidently forgot that a trade-mark is a common law right, and therein differs from label registration."

The first decision under the new law prepared by Assistant Commissioner Dryenforth, holding that trade-marks, though registered under the old law, may not be indiscriminately applied for, has recently been promulgated in the case of Lyon, Depuy & Co. The applicant sought to register as a trade-mark for wheat flour the word "Triumphant." The examiner refused registration because the mark too nearly resembled the trade-mark of Imbs, Meyer & Co. As this decision will establish the rule which will be enforced by the Patent Office in similar cases, it possesses exceptional importance to all classes of inventors and manufacturers. After briefly reviewing the case and the acts bearing on it, the decision says: "The question here raised is, What shall be regarded as sufficient evidence that an applicant is not entitled to the trade-mark he seeks to register? It is understood that the applicants in this case admit that their trade-mark is substantially the same as that registered in 1876 by Imbs, Meyer & Co., which is cited as a reference; but make the point that, inasmuch as the registration was not authorized by law, therefore it cannot be accepted by this office as evidence of the existence of such trade-mark, nor of prior use or ownership by others, nor, in fact, of anything which could tend to defeat the registration of the trade-mark they present."

After a comprehensive analysis of the obvious intent and meaning of the statute, the application under consideration being in proper form, and, in the absence of any showing against it, entitles the applicants to registration of the trade-mark as prayed, Commissioner Dryenforth concludes: "In passing upon the sufficiency of the reference I endeavor to act upon principles of common sense. The registration of Imbs, Meyer & Co., was complete under the law of 1870, and established, not only title to the trade-mark in controversy, but that they had been using it for 10 years. There is no pretense that that record does not disclose the exact truth. The point made is that the law under which that solemn act took place and the record of it was made up was unconstitutional, and, *ergo*, I must shut my eyes to what that record discloses. But the statute says that applicants shall not be entitled to registration of a trade-mark which is identical, or substantially identical, with the registered or known trade-mark of another. This record discloses to me that applicants are seeking to register substantially the known trade-mark of another—to wit, that of Imbs, Meyer & Co. It is true that these parties may have abandoned their trade-mark, but abandonment is not to be presumed. If it had become worthless no other person would have sought to appropriate it or that which is substantially identical with it.

"It is said that to act upon the record of registration made under the law of 1870 would be, in effect, the same as citing a rejected application for a patent. This is error. If there is any similarity, it is more like citing a patent itself, and the full record of public use. To decide otherwise would be to open Pandora's box, and turn loose fraud upon individuals and imposition upon the public. On the other hand, the construction I give the statute cannot work any hardship. Certainly, it is no injustice to an applicant to require him fairly to establish that he is the owner of the property he seeks to appropriate as his own. If a former registrant has abandoned his property, it is easy to ascertain and prove the fact. If applicants have by purchase or otherwise legally acquired the right to the property, it could not be difficult to establish that fact. It is contended that the registration of a trade-mark confers no title thereto. Neither does the registration of a deed to land confer title. But the certified transcript of the record is evidence of title, and that statute permits registration of a trade-mark as a means of preserving in a public record evidence of ownership, and, since it is evidence of ownership, care has been taken in the statute to provide against fraudulent registration.

"It is said that I am giving the registration under the law of 1870 the same force and effect as if it had been made under the statue of 1881. This is palpable error. I find here in this office a public record—public in the sense that it is open and notorious, and may be seen and read by all men—in which is recorded a *fac-similie* of trade-marks, with a full statement of ownership, and period of use, &c., all under the sanction of an oath. This public record discloses that Imbs, Meyer & Co., in 1876 registered a trade-mark, proved that it was their property; that they were using it attached to flour; that they had been so using it for 10 years next preceding the date of their application for registration. Now, I do not hold that that registration has the force and effect of a registration made under the present law. Nothing of the kind. But I do hold that I am properly authorized under the provision of Section 3 of the act of 1881, and by the true spirit and intent of the whole statute, which is to prevent and not to connive at fraud and imposition, to take notice of the facts recited in that record, in determing the 'presumptive lawfulness of claim to the alleged trade-mark' by the applicants. I hold, therefore, that the examiner was clearly justified in rejecting applicant's petition of registration on the reference of Imbs, Meyer & Co., which disclosed that they were and had been for many years using that identical trade-mark, or one substantially the same, on flour; that they had been so using it for a long time before the applicant's claim to have known of it or sought to use it."

The Secretary of the Treasury, Mr. Gresham, has just promulgated the full decisions of the department for the month of September upon the construction to be given to acts of Congress relating to the tariff.

THE DUTY ON CLOCK KEYS.

In the appeal from an assessment by the collector at New York of 40 and 45 per cent. on certain clock keys and glass shades for covering clocks, the appellants claiming entry at the rate of 30 per cent. ad valorem as "parts of clocks," the Secretary of the Treasury affirms the decision on glass shades on the ground that the assessment of duty at the rate of 40 per cent. ad valorem on the glass shades is in accordance with the department's decision of November 13, 1883 (Synopsis, 6014). The appraiser reports that the keys are manufactured of iron, and are such as are commonly used for winding clocks, but may be used for other purposes. The department is of opinion that such keys are embraced in the provision in Schedule N, act of March 3, 1883 (T. I., new, 414), for "parts of clocks," and the collector is authorized to readjust the entries accordingly, and to take the necessary steps for refunding the excess of duty.

SILVER ORE PARTIALLY WORKED DUTIABLE.

The collector of customs at San Francisco, having assessed duty at the rate of 10 per cent. ad valorem on certain so-called concentrated silver ore, which the appellants claim to be exempt from duty, the Secretary of the Treasury affirmed the decision of the collector on the ground that "upon an inspection of a sample it is ascertained that the article is silver ore which has been advanced in value or condition by grinding or by other process of manufacture. Silver ore, although non-dutiable in its crude state (T. I., new, 732), becomes liable to a duty of 10 per cent. ad valorem (under T. I., new, 95) when it is imported in an advanced condition, like the article in question."

DUTY ON STEEL-RAIL CROP ENDS.

In giving the reasons for the recent affirmation of the assessments of duties at the rate of 45 per cent. ad valorem on certain so-called steel-rail crop ends, the appellants claiming them to be dutiable at the rate of 20 per cent. ad valorem, the Acting Secretary of the Treasury, says: "It is understood from the report of the appraisers that these steel-rail crop ends are the waste material from the manufacture of steel rails, or, in other words, the scrap or defective ends of rails which have to be sawed off after rolling. Steel of this description is not specified in the tariff act, and it therefore follows that it is dutiable at the rate of 45 per cent. ad valorem, under the general provision in Schedule C for 'steel not specially enumerated or provided for in this act.' This view was taken by the department in a late case involving the question as to the classification of new scrap steel (Appeal 9162 *i*)."

STEEL LOCOMOTIVE TIRES.

In reply to an appeal from an assessment of duty at the rate of 2½ cents per pound on certain so-called forgings which the appellants claimed to be dutiable at 2 cents per pound, the Acting Secretary of the Treasury says, in affirming the collector's decision: "It appears, upon investigation, that the articles consist of locomotive tires and wrought-iron rings which form a part of the tires in the manner indicated by the inclosed diagram. Under Schedule C (T. I., new, 179), 'iron or steel locomotive, car and other railway tires, or parts thereof, wholly or partly manufactured,' are liable to a duty of 2½ cents per pound, and in the opinion of the department the articles in question are liable to that rate of duty."

SYNOPSIS OF LATEST DECISIONS.

The following is a synopsis of decisions rendered by the department of the Treasury during the past week under the metal schedules, full copies of which will appear in the monthly digest: Metal ornaments, intended to form parts of buttons, are not to be classified as buttons or button molds, but being button material, made of metal, are dutiable as manufactures of metal, under Paragraph 216, Schedule C. (Letter to surveyor of customs at Cincinnati.) Oval shaped charcoal iron not being embraced in Paragraph 148, Schedule C, is not dutiable as charcoal iron. (Letter to collector of customs at Boston.)

Adoption of the Greenwich Meridian.

The International Prime Meridian Conference reassembled at Washington on the 13th inst.

Mr. Sanford Fleming, of Canada, made an argument against the adoption of the neutral meridian recommended by the French delegates, while Dr. Crues, of Brazil, spoke in favor of it. Upon putting the question to a vote the proposition to adopt a neutral meridian was defeated—yeas, 3; nays, 21, each nation casting a single vote. Mr. Rutherford then renewed his original resolution, which was as follows:

"The conference proposes to the Governments here represented the adoption of the meridian passing through the center of the transit instrument at the observatory of Greenwich as the initial meridian for longitude."

Mr. Fleming, of Canada, moved as an amendment that the conference adopt the 118th degree of longitude, west or east from Greenwich, as the prime meridian, but the other delegates from Great Britain opposed this amendment, and it was lost. Mr. Lefaivre, of France, said that the meridian of Greenwich was not the scientific meridian; that it implied no progress in any of the sciences, but was merely a commercial standard. Since, therefore, nothing would be gained to science by adopting Greenwich, France could not make a sacrifice of her own meridian, and incur the vast expense consequent upon the adoption of a new one, because she would thereby gain no advantage whatever.

Sir William Thompson was present as a guest, and, by invitation of the conference, spoke at some length in favor of the adoption of Greenwich. He held that it was purely a matter of convenience, and that Greenwich answered the convenience of the world better than any other standard meridian.

Sir Frederick Evans, of Great Britain, then presented a comparative statement showing that the tonnage of shipping controlled by the Greenwich standard of longitude was in round numbers 14,000,000 tons, while that controlled by the Paris standard was only 1,735,000 tons. He also submitted a statement of the number of charts, &c., purchased by nations outside of Great Britain for scientific and commercial purposes, in order to show how largely that meridian is now being used. Mr. Rutherford's resolution in favor of Greenwich as the prime meridian was then adopted, 21 nations voting in favor of it; one, San Domingo, against it, and France and Brazil abstaining from voting.

It is reported that Van Rysselberghe, in Belgium, has solved the problem of transmitting a telegraphic and a telephonic message along the same wire at the same time. A trial of this has been made at the Antwerp Universal Exhibition, where concerts held in important towns in Belgium were heard, the transmission being made with ordinary instruments along ordinary telegraph lines and with earth returns.

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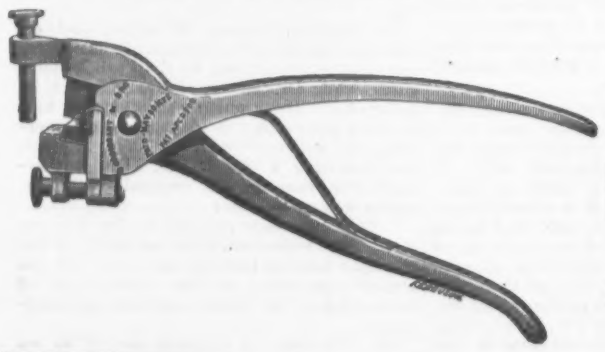

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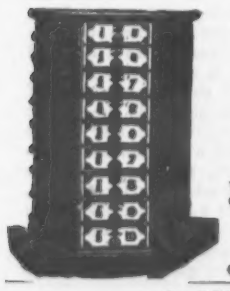

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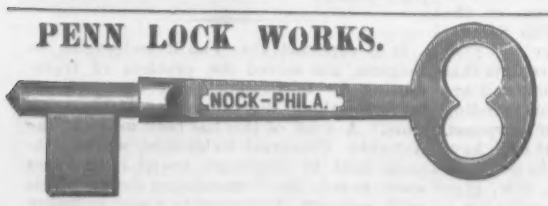

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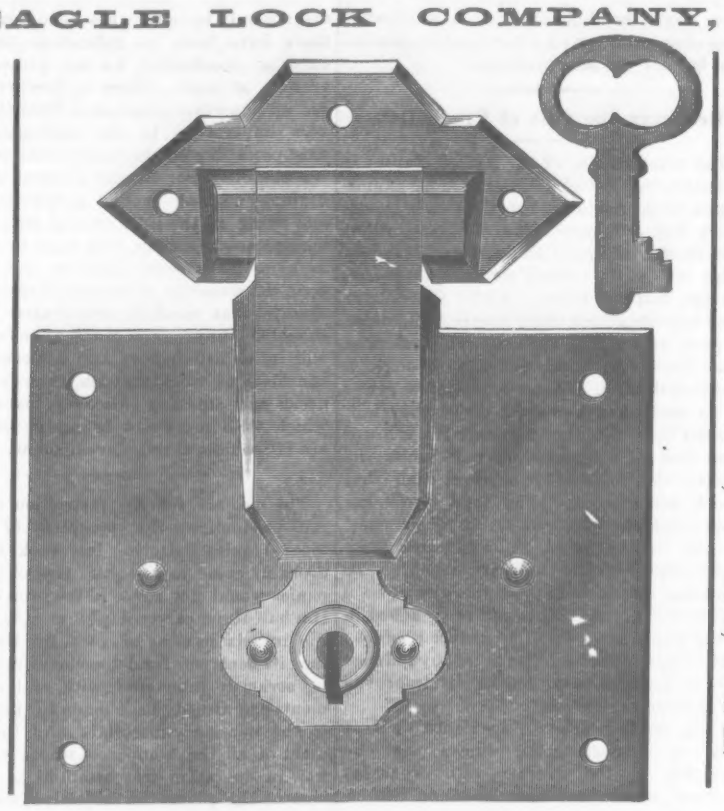

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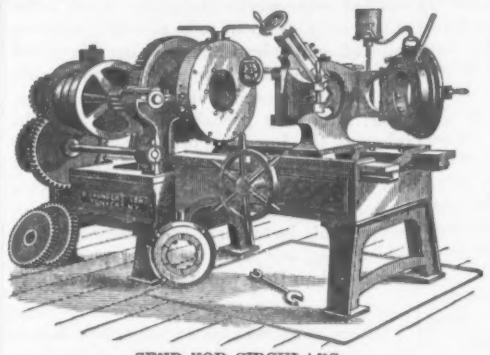

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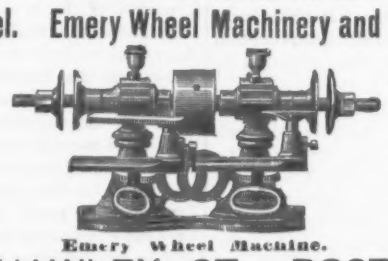

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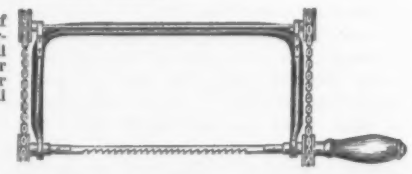

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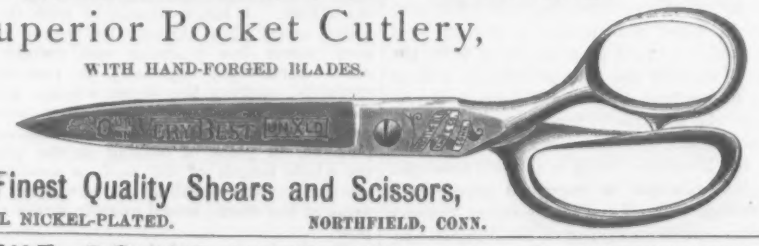

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No. 1.—All that certain messuage, tenement and tract of land situate in Richmond Township, Berks County, Penna., adjoining lands of Samuel Kaufman, John Rothermel, Solomon Leibensperger and others, containing one hundred and seventy-five and one-half acres, more or less, on which are erected a stone dwelling house, large Swiss barn and other buildings. This tract contains a body of iron ore known as the "Moselem Iron-Ore Bank." There are also erected upon this property at the mines complete machinery, &c., for mining and washing iron ore, including engines and pumps.

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Boiler Explosion.

Will take place on the Government grounds at Sandy Hook. Parties wishing to witness the explosion can apply or address for particulars,

LESLIE BOILER WORKS,
70 and 72 Pearl Street, Jersey City.

Wanted.

A Spike-Maker accustomed to working on the Koplin Machine and to making Roller and Pressed Points. None but first-class workmen need apply, and applicant must furnish recommendation. Address communication to

POST OFFICE LOCK BOX 5, Reading, Pa.

Special Notices.

NEW AND SECOND-HAND
MACHINERY.

1 84-in x 21 ft. Bed Lathe. 2d-hand.
1 80-in. x 40 ft. Bed Lathe. "
1 88-in x 20 ft. Bed Lathe. "
18 Engine Lathes, 11 in to 74 in. sw. New and 2d-hand.
1 Plain Lathe, back-geared 2d-hand.
5 Hand Lathes, 9 in. to 22 in. sw. New and 2d-hand.
1 Oval Turning Lathe. 2d hand.
14 Iron Planers, 16 in. to 60 in. wide. New and 2d-h'd.
5 Shapers, 6 in. to 20 in. stroke. " "
3 Power Drill Presses. New and 2d hand.
5 Gang Drills. New and 2d hand.
3 Bench Drills. New.
2 Post Drills. "
1 Double-Head Horizontal Drill. 2d-hand.
9 Milling Machines. New and 2d-hand.
2 Gear Cutters.
1 Centering Machine.
2 Cutting-off Machines.
2 Nut Tappers.
2 Screw Machines.
1 Cutter Grinder.
9 Emery Grinders, different styles.
16 Polishing Stands and Frames.
1 Steam Hammer.
3 Shaft Straighteners.
4 Punching Presses
5 Foot Presses.
5 Drop Presses.
6 Power Shears.
2 Bar Iron Cutters. 2d-hand.
1 Filter Press, six plates. Second-hand.
1 Lot Headers, Crimpers, Formers, Presses, Dies, &c., for Small Cans. 2d-hand.
Lot Grindstone Frames, Pulleys, Hangers, Chucks, &c., &c.
1 each Nos. 5 and 7 Sturtevant Blowers. 2d-hand.
1 Tillwell Heater, 3 ft. x 8 ft. 2d-hand.
1 16 ft. x 30 in. Cylinder Boiler. 2d hand.
1 15 H.-P. Locomotive Boiler. 2d-hand.

All the above at extremely low prices and on favorable terms.

Write and state just what you want.

J. M. BADGER.

49 DEY STREET, New York City.

For Sale.

4 35-Gal. Steam-Jacketed Kettles.
2 100-Gal. Steam-Jacketed Kettles.
1 200-Gal. Steam-Jacketed Kettle.
5 Meat Choppers, different Sizes.
1 large Lard Press.
1 Lard Cutting Machine.

All of the above used less than two months. A reasonable offer will not be refused.

1 3-H. P. Engine.
1 5 H. P. Engine.
3 8-H. P. Engines.
2 4-H. P. Boilers.
1 6-H. P. Boiler.
1 10-H. P. Boiler.

H. M. SCIPLE, 107 and 109 N. 3d St., Phila.

For Sale.

After Jan. 1, 1885, a clean, neat stock of Hardware, Stoves, Tinware and Stove Fixtures, with Tin and Cornice Shop connected, doing a big business. Have contracted 52 jobs of Cornice in the last six months Stock is located in one of best business towns in Texas—town of 10,000 inhabitants; has five railroads, street cars, gas and water works, and only 10 years old. Stock will invoice about $10,000. Terms cash.

Address "STOCK No. 1,"
Office of *The Iron Age*, 83 Reade Street, New York.

For Sale.

Two new, first-class Engine Lathes; each back-geared, screw-cutting, rod-feed, power cross-feed, compound rest, full counter, friction pulleys, center rest, two face-plates, &c. One, 16-foot x 26 inch, $625. One, 16 foot x 20 inch, $416.

E. CORNISH,
Manchester, N. H.

For Sale,

owing to the death of one of the partners and ill-health of the other, the Stock and Fixtures of the best retail Hardware store in Kansas City.

For further particulars, address

P. P. BURROUGH,
Kansas City, Mo.

For Sale.

A full line of Hardware, Stoves, Iron and Tinware, centrally located in the largest and best manufacturing city in Northern Indiana. Well established, with an excellent trade. Stock clean; will invoice about $10,000. Address

"X. Y. Z. & Co.,"
Office of *The Iron Age*, 36 Clark St., Chicago, Ill.

Special Bargains in Machinery.

2 Rotary Pumps, $15 each. Steam and Boiler Feed Pumps. Bolt Cutter, ¼ to 1½ in., geared, $75. 2 Portable Hoisting Engines, $300 and $350. 8 H.-P. Engine, $125; 10 H.-P., $150; 12 H.-P., $160; 15 H.-P., $175; 20 H.-P., $200. Second-hand Engine Lathes, 16 to 30 in. swing; 2d-hand Planers, 6 sizes; Drill Presses, 6 sizes; Punch Presses. All practically good as new. Also full assortment NEW Drills, Planers, Lathes, Engines, &c., &c.

AMERICAN TOOL CO., Cleveland, Ohio.

Lathes for Sale. Shears for Sale.

Engine Lathe, 19 in. swing, 7 ft. bed, Whitcomb, maker, weight 2000 lbs.; price only $200, with counter and gears. Engine Lathe 14 in. swing, 6 ft bed, Wood, Light & Co., make; complete, $150; both these lathes are in running order. One Power Shear, new, for 5-16 plate iron. One new Alligator Shear, cuts 1 1-4 round or 3-4 x 2 flat bar iron. One new Power Press, punching 1-2 x 1-2. Also several smaller Presses, power and foot.

Peerless Punch and Shear Co. 38 Dey st., New York.

For Sale.

Over 300 Engines and Boilers can be bought below cost; must reduce stock.

H. M. SCIPLE,
107 and 109 N. 3d St., Philadelphia.

FOR SALE.

24 in Planer, five Drill Presses, four Lathes, Milling Machine, Blade Grinder, Nut Punch, Bar Shear, 6-inch Allen Governor.

A. G. BROOKS, 261 N. Third St., Phila.

For Sale.

4 to 60 H.-P. Horizontal Engines. 2 to 40 H.-P. Vertical Engines. Steel Boilers, all sizes, *as low as Iron.*

A. G. BROOKS,
261 N. 3d Street, Philadelphia.

Having made arrangements with Hardware Manufacturers for the sale of their goods in the Eastern and Western markets, I solicit further correspondence, with the view of increasing my lines.

DONALD McKAY,
100 Chambers St., New York.

WANTED.—A gentleman who is well acquainted with the Jobbing Hardware Trade of the Northern States, East and West, wants the sale of two or three factories goods. Would like a Nail Works. Address "COMMERCIAL, Y,"

Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

A Rare Chance for Foundrymen and Machinists.

The G. A. Kelly Manufacturing Co., 3½ miles west of Jefferson, Texas, on the M. & P. R.R., will be sold at a bargain, as the present owners (bankers and merchants) are inexperienced in this line of business, and have not the time to devote to operating same.

Without exception, it has the finest machinery for putting up Wagons, Plows, &c., by Steam in the South, and by an addition of patents any and all articles made of iron can be successfully made. A Furnace situated a mile from works, making Car Wheel and Foundry Iron second to none.

Plows of this Company's make have a wide and established reputation, with a good trade in Arkansas, Louisiana and Texas.

There is belonging to Works 100 Acres of Land, with sufficient Houses for accommodation of employees. Situation healthy, with abundance of pure water.

Works unencumbered.

Timber plentiful adjacent Works.

For further information, address

R. BALLAUF & CO.,
General Managers,
Jefferson, Texas.

For Sale.

Vertical Tubular Boilers, complete and ready for delivery. All made of the best C. H No. 1, 50,000 lbs. Flange Iron, double riveted and hand-made.

One 55 H.-P., 6 ft. diam., 9 ft. 2 in. high, submerged heads ⅛ in. iron. Good for 115 lbs of steam.

Two 40 H.-P, 48 in. diam., 10 ft. high, complete. ⅜ in. shell, ⅛ in. heads.

One 28 H.-P., 42 in. diam., 9 ft high, 88 2-in. tubes.

One 24 H.-P, 44 in. diam., 8 ft. high.

One 20 H.-P., 40 in. diam., 7 ft. 2 in. high, with 88 2-in. tubes; also several smaller Boilers.

Also one second-hand 70 H.-P. Horizontal Tubular Boiler, 54 in. diam., 16 feet long, with 68 3-in. tubes. Good for 80 lbs. of steam. With full front and all castings complete.

One 30 H.-P. Vertical Tubular Boiler, 5 ft. diam., 7 ft. high. Used 6 months; good as new, and all complete.

I have also a large lot of Tools, such as Lathes, Planers, Milling Machines, and Engines from 4 H.-P. to 60 H.-P. All new. At bottom cash prices.

JOSEPH LUMLEY.
144 North Third street, Philadelphia, Pa.

For Sale.

One 50-foot Air Hoist for Blast Furnace, air cylinder 30 inches internal diameter, with necessary sheaves. Will hoist two barrows of stock at once. Apply to

POTTSVILLE IRON AND STEEL CO.,
Pottsville, Pa.

For Sale.

The largest stock of New and Second-hand Engines, Boilers, and general Machinery in the West. Send for Catalogue. Hoisting Outfits for Coal Mining and other purposes a specialty.

WARREN SPRINGER,
195 to 219 South Canal St., Chicago.

For Sale.

Second-hand

DROPS and LIFTERS.

BEECHER & PECK,
Lock Box 122, New Haven, Conn.

THE CLEVELAND

Storage Company

Are prepared to receive **PIG, BAR AND SHEET IRON, LUMBER AND ORE,** Blooms, Ingots, Muck-Bar, Car Wheels, Rails, Machinery, Nails, &c We also arrange to store **Pig Iron** at Furnaces, **Lumber** at Mills or in Yards, **Ore** on Docks or at Mines. Warrants will be issued on all stock received, made transferable by indorsement and deliverable to the holder on demand. These warrants will furnish a convenient medium of transfer and delivery, and serve as collateral to parties wishing advances on their stock. Correspondence solicited.

W. R. DRAKE, Sec. Room 35,
Merchants' Bank Building. Cleveland, Ohio

J. SEIDEL,

Commission Merchant,

Box 662,

HABANA, CUBA,

Will be happy to accept the representation of first-class houses manufacturing hardware. Bills paid and collected on commission.

Reference:

COLLINS & CO., 212 Water Street, New York.

LEIGH'S

DISCOUNT BOOK

Specially arranged for the use of the

HARDWARE TRADE.

Acknowledged by ALL the best work of the kind ever published. Price by mail ONE DOLLAR.

Address **E. B. LEIGH,**
Sec'y The American Brake Co., St. Louis, Mo

Wanted—Partner,

either active or special, with $25,000 to $40,000, to join an established wholesale Hardware business in the West. A good opportunity for party desiring investment.

Address "X,"

Office of *The Iron Age*, 83 Reade St., New York.

GRADUATED ENGINEER, experienced in Gas and Direct Heating Furnaces and Mill Machinery, wishes to change his present position. Address

"248, B.,"

Office of *The Iron Age*, 83 Reade St., New York.

WANTED—A Salesman for Hardware and Agricultural Implements. Location, a city on the Hudson River. Address "H. A. J.," office of *The Iron Age*, 83 Reade st., New York City, stating where formerly employed, and salary expected.

CHEMIST.

Wanted—A position as Chemist by a graduate of the School of Mines, Columbia College. Will engage in any sort of chemical or metallurgical work. Address S. M. C. COLL,
220 South 5th St., Reading, Pa.

FIRM of English merchants and manufacturers require, January 1, 1885, an agent in New York, to obtain orders for English Saddlery, Sheep Shears, Chains, General Hardware, &c. Payment by commission. Security and references required. Apply BOX 21 Post Office, Walsall England.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, October 15, 1884.

Scotch Pig.—The market is a little steadier. We quote makers' brands as follows:

Coltness, alongside, Glasgow			60/
Langloan,	"	"	58/
Gartsherrie,	"	"	56/6
Summerlee,	"	"	54/
Carnbroe,	"	"	50/6
Glengarnock,	"	Ardrossan	50/6
Eglinton,	"	"	44/6
Dalmellington,	"	"	47/6
Shotts,	"	at Leith	54/6

Lighterage from Ardrossan to Glasgow is 1/ ₱ ton.

Cleveland Pig.—The market is unchanged. Makers are considering a proposal to restrict production until trade revives. We continue quotations, f.o.b. shipping ports:

Middlesboro,	No. 1 Foundry	41/
"	No. 2 "	39/
"	No. 3 "	37/ @ 37/6
"	No. 4 Forge	36/

Bessemer Pig—Is a little steadier. Quotations are unchanged, viz.: W. C. Hematites, 44/6 @ 46/ for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The quarterly meetings just held have resulted in confirming present prices. We quote at works:

	£	s.	d.	£	s.	d.
Staff. Ord. Marked Bars	7	10	0	@	.....	
" Medium "	6	0	0	@	6 10	0
" Common "	5	10	0	@	5 15	0
Hoops, 20 W. G. and over.						
" Common Best	6	15	0	@	.....	
" Medium	6	5	0	@	6 10	0
" Common	6	0	0	@	6 7	6
Sheets, 20 W. G. and under.						
" Ordinary Best	7	15	0	@	8 5	0
" Common	7	5	0	@	7 15	0
Welsh Bars	4	17	6	@	5 2	6

Steel Rails—Have been depressed during the week, but a better feeling now prevails, and prices are very firm. We quote, unchanged, £4. 15/ @ £4. 17/6, f.o.b. shipping ports.

Old Rails—Are unchanged. We quote Old D. H.s £2. 17/6 @ £3, c.i.f. New York.

Scrap.—The market is unchanged. Heavy Wrought is quoted £2. 10/ @ £2. 12/6, c.i.f. New York.

Copper.—The market has been almost paralyzed during the week, but under a better feeling prices are firm. We quote Best Selected, £59 @ £60, and Chili Bars, £53. 10 @ £54. 5/.

Tin—Is in quite a panicky state, and quotations are difficult to give. The following are as near as can be given under the present condition of the market, viz.: Straits Ingots, spot, £73 @ £73. 10/, and futures, £73. 10/ @ £74.

Tin Plates.—The market is irregular. We quote:

Tin Plates, 10x14,	1st qual.	Charcoal	19/6 @ 21/6
" "	2d "	"	18/6 @ 19/
" "	1st "	Coke	17/6 @ 18/
" "	2d "	"	15/ @ 15/6

Spelter.—Is a little steadier. We quote Ordinary, at shipping ports, £14. 10/ @ £14. 12/6.

Lead.—The market is quiet. We quote Common English Pig, £10. 15/ @ £11.

Freights.—Steam from Glasgow to New York, 2/6 @ 3/; Liverpool to New York, 5/; Liverpool to Philadelphia, 5/ @ 6/6, and London to New York, 7/6 @ 9/6.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, October 15, 1884.

For the moment attention is engrossed by the October elections, and no marked change either in the financial or mercantile situation is looked for until the political future is more clearly defined. The fall trade continues backward, and excepting at a few points in the Northwest there are no special signs of activity. According to returns received by the Boston *Post* from the leading clearing houses of the United States, the aggregate clearings last week were $740,757,352, against $805,001,115 the previous week, and $1,108,765,662 for the corresponding week last year. Compared with the corresponding date last year, the total decrease is 33.2 %, taking the country as a whole, while in New York the diminution is equal to 40 %, mainly on account of dullness on the Stock Exchange as well as in the speculative markets. In Philadelphia cooler weather has quickened the distribution in some lines of goods. In Boston nearly all branches report a slow and unsatisfactory movement. The suspension of work in so many manufacturing establishments throughout the country is coming to be felt, and manufacturers in particular are speculating somewhat upon the probable effect of the low prices of cereals on the consuming power of the West. In Minneapolis merchandise jobbing compares favorably with a year ago. In Kansas City the fall trade is in full swing, and at Detroit, Cleveland and other Western points collections are easier. At Southern commercial centers trade is restricted by the scarcity of money.

Dry-goods jobbers speak of a quiet market. Cotton has been in demand, but transactions are confined almost wholly to Southern markets, and the tone is easier all round, with prices weakened by free receipts. In breadstuffs there has been very little animation. With unexpected heavy receipts and a scarcity of foreign orders prices continue to droop. Speculation in corn is light, governed by fluctuations in Chicago. In cotton the slack foreign demand and weaker options have a depressing influence. In provisions trading is limited to small lots; market steady; pork and lard easier. Wool dull and easy. Tobacco quiet and firm. Spirits of turpentine and linseed oil firm. Sugars have a stronger tone. Teas are steady. Coffee quiet. Ocean freights are quiet, with little demand for petroleum vessels on account of the unsettled condition of the crude speculative market.

On the Stock Exchange the market was generally unsettled and lower at the opening of the week, but gained strength toward the close. The grangers were influenced unfavorably by the reported cutting of rates, and the Coal stocks were similarly influenced by a report that Vanderbilt had sold a large block of Central New Jersey previously held by him, and that in consequence the lease to Reading would be canceled. The latter was officially denied. A report that Pool Commissioner Fink would resign in consequence of trouble brewing between the Pennsylvania and Baltimore and Ohio roads operated prejudicially to the trunk lines until subsequently disproved. Union Pacific and Lackawanna also declined with little resistance. On Monday a bear movement caused a covering of share contracts and prices advanced. The Gould stocks were particularly strong, and Manhattan Consolidated advanced on Judge Pratt's decision, favoring reduced taxation. To day prices drooped again, attributable rather to railroad troubles than to new political phases. The Coal shares weakened on the report of an intended suspension of mining for three weeks. Quotations as follows: Canadian Pacific, 45; Central Pacific, 41; Lackawanna, 106½; Delaware and Hudson, 84; Erie, 14⅛; Kansas and Texas, 18; Lake Shore, 74⅞; Louisville and Nashville, 26⅛; Manhattan Consolidated, 76½; Missouri Pacific, 96⅛; New York Central, 94; Jersey Central, 44; Northwest, 90⅝; Ohio Central, 2⅛; Reading, 21⅞; St. Paul, 80⅜; Manitoba, 82½, Western Union, 64¾; Northern Pacific, 19¾; Oregon and Transcontinental, 13¼; Pacific Mail, 56¼; San Francisco preferred, 43; Union Pacific, 57¼.

United States bonds closed as follows:

	Bid.	Asked.
U. S. 3 per cents	100	—
U. S. 4½s, 1891, coupon	112⅛	112⅜
U. S. 4s, 1907, coupon	120	120¼
U. S. Currency 6s, 1895	125	—
U. S. Currency 6s, 1896	126	—
U. S. Currency 6s, 1897	127	—
U. S. Currency 6s, 1898	129	—
U. S. Currency 6s, 1899	131	—

The weekly bank statement shows a continued accumulation of money at this center, quite extraordinary at this season of the year, when the largest calls are made to assist in moving the crops. During the week the banks gained $2,215,625 in surplus reserve, which now stands at $32,113,300, against $2,165,075 at the same time last year and $1,855,490 at the corresponding date in 1881. The loans show a gain this week of $137,800. As cotton is moving out more freely, the demands of shippers on this account are likely to increase, and it is noticed that in the West there is rather more inquiry for money, while there have been considerable remittances from this point South in the shape of silver certificates. A leading Wall street broker estimates that $40,000,000 will be required this year for the movement of cotton alone. Money is a trifle more active this week, but supplies are abundant to good borrowers and indorsed bills receivable are quoted 5½ @ 6 %.

The returns of our foreign commerce for September complete the statistics for the third quarter of the year. The total imports show a further decline compared with the corresponding month in recent years, but the receipts of merchandise, exclusive of specie, are somewhat increased. The classification of imports for nine months ending September 30 compares with the last two years as follows:

	1882.	1883.	1884.
Dry goods	$105,218,401	$97,707,433	$94,683,791
Gen'l mdse	273,088,689	242,296,309	229,284,559
Specie	3,101,187	11,754,141	14,251,450
Total	$381,408,227	$351,757,888	$338,220,100

Turning now to the exports, the results for September are disappointing, the total, exclusive of specie, falling to $26,819,317, which is the smallest total for eight years. For nine months from January 1 the comparison is as follows:

	1882	1883.	1884.
Dom. produce	$244,632,945	$254,155,268	$233,003,954
For. free goods	4,162,490	5,628,246	3,624,098
Do. dutiable	4,551,088	4,702,908	3,740,589
Sp. and bullion	45,211,520	15,089,066	49,991,590
Total exports	$298,558,043	$279,576,102	$290,360,231

For the whole country the balance of our foreign trade for eight months was $49,309,004, which September is likely to increase when all the returns are received.

The imports of foreign merchandise at this port during the week were quite light, the total being but $6,325,045, of which $4,897,933 was general merchandise and the remainder dry goods. Compared with the previous week the decrease approaches $2,000,000, about equally divided between the two items. Since January 1 up to date the total is $341,302,135, compared with $363,070,612 for the corresponding time in 1883. The exports of domestic produce from this port during the past week were rather light, the total being $5,651,958, against $6,789,550 for the same week last year. Since January 1 the total is $254,684,334, compared with $281,911,681 for the corresponding period of 1883. According to the Custom House report the specie exports amounted to $217,787, mostly in silver, bringing the total since January 1 nearly up to $49,000,000, and the imports for the same time were $325,009, mostly in gold, making a total of $19,750,330 since January 1.

The business failures of the week, as reported to our mercantile agencies, are in point of number almost identical with those of the previous week. The failures are below the average in the Western, Pacific and New England States, but a corresponding increase is noted in the Southern and Middle States and in New York City. The schedules of Mallon & Rourke, iron founders, of this city, show liabilities, $65,761; nominal assets, $60,030; actual assets, $5317.

The posted rates for sterling exchange now stand at $4.82 for 60 day and $4 85 for demand, in consequence of the advance of the Bank of England rate to 3 %. A still higher bank rate is looked for, owing to the firmness of money in London.

The report of the Department of Agriculture on the cotton crop is to the effect that the average of condition has fallen off nearly eight points—from 82.5 to 74.7—as the result of continued drought. The drought is reported to have been general and its effect manifest in every State.

The director of the mint estimates the amount of gold and silver coin in the United States on October 1, 1884, to have been $815,000,000. Of this amount $558,000,000 is gold, $182,000,000 standard silver dollars and $75,000,000 subsidiary silver. This is a gain from October 1, 1883, of $35,000,000—$13,000,000 being gold coin and $22,000,000 silver.

The Monetary Conference will be held in Paris in the latter part of October. Switzerland proposes the withdrawal of light five-franc pieces and an increase of silver-token coin.

The Bureau of Statistics report the exports of provisions for September to have been valued at nearly $9,000,000, against $7,500,000 for September, 1883. For the eight months ended August 31, 1884, the total exports of petroleum were less than during the corresponding period of 1882 by 17,800,890 gallons and $311,004 in value.

New York Iron Market.

The condition of the market is one of extreme quiet. No sales of any importance have occurred in any of the primary branches of the Iron trade, but negotiations are on foot for considerable quantities of Steel Rails, and the Brooklyn Elevated Railroad has purchased a large part of the rolling stock required for the operation of its system. It is reported that this railroad company has contracted for 30 light locomotives from the Rhode Island Locomotive Works, on private terms, and is negotiating for passenger cars. We do not hear of any special weakness in prices, the general opinion being that prices are now low enough, and, if purchasers are not willing to pay them, that it is better to cease producing than to endeavor, by reducing quotations, to effect sales. The political excitement of the week has undoubtedly had an injurious effect upon business, which, it is hoped, will not be prolonged until after the general election in November. There may be, however, several more weeks of stagnation to look forward to.

American Pig.—There has been no demand of any special consequence during the week. Sales of Pig Iron have been made to a limited extent, but there has been no life to business, and sellers have not endeavored to push trade under the circumstances, realizing that it would be impossible to accomplish anything without seriously sacrificing prices. The largest companies represented here are still delivering heavy quantities of Iron on old contracts, and state that they are not burdened with accumulated stocks, but other establishments, notably those outside of the general range of this market, are somewhat anxious for business, though even they do not seek to push their product upon consumers at present. The stock of No. 1 X Foundry is now reported to be so small in the territory supplying this vicinity that it is doubted whether any increased demand could be supplied without producing an immediate effect upon prices, but the quantity of No. 2 X Foundry held still continues to be so ample that buyers are not disturbed by a threatened scarcity of No. 1. The reports of cutting on No. 2 X, however, are not so frequent this week as usual, and, in fact, some of the best-known brands have been sold at outside figures. The condition of trade is almost one of suspended animation, practically, so that there is nothing at present on which to base an opinion of its future course. Much will depend upon the developments of the next three weeks. In the meantime we quote standard brands of North River and Lehigh Irons as follows, tidewater delivery: No. 1 X, $19.50 @ $20.50; No. 2 X, $18 @ 19; Gray Forge, $17 @ $18. Outside brands about $1 cheaper.

Scotch Pig.—The arrivals of Scotch Pig during the week aggregated 1500 tons, of which 300 tons were shipped in bond to the West. The quantity received for local delivery was almost entirely sold to arrive, a small quantity having been put in store. While the trade generally has been very dull, some parties have made considerable sales, amounting, all told, to about 1000 tons for shipment. Quotations are unchanged, being as follows for small lots: Coltness, $22 @ $22.50; Gartsherrie, $21 to arrive, $22 from yard; Shotts, $21.50 @ $21.75 to arrive and $22 from yard; Langloan, $21.50 to arrive and $22.50 from yard; Carnbroe, $20.50 to arrive and $21.25 from yard; Glengarnock, $20.50 to arrive; Summerlee, $21 to arrive; Dalmellington, $20 to arrive; Eglinton, $19.25 @ $19.50 to arrive; Clyde, $20 to arrive.

Bessemer Pig and Spiegeleisen.—In the absence of transactions Foreign Bessemer continues to be quoted at $18.50 @ $19 for shipment, and Spiegeleisen at $26.50 @ $27.50 for 20 %, according to brand.

Bar Iron.—The demand for mill lots has not been active, though some agents report a fair amount of orders entered during the week. Prices continue to be more or less demoralized, particularly on the lower grades, on which concessions are frequently made when necessary to secure sales. Store trade is still without animation, and prices are being cut to some extent. We quote Best Refined, at mill, 1.7¢ @ 2¢; from store, 2¢ @ 2 2¢; Common Iron, at mill, 1.5¢ @ 1.7¢; from store, 1.9¢ @ 2¢.

Structural and Shaped Iron.—Business under this head has been very quiet, only small lots having changed hands. We quote as follows in small lots: Angles, from store, 2.3¢ @ 2.6¢; Tees, from store, 2.9¢ @ 3¢; Beams and Channels, on docks, 3.5¢.

Plates.—There is a moderate movement in this line, but orders are very small and prices weak. We quote as follows for small lots of Iron Plates: Common or Tank, 2¼¢ @ 2.3¢; Refined, 2½¢; Shell, 2¾¢; Flange, 3¼¢; Extra Flange, 4¢ @ 4¼¢. Quotations for Steel Plates are as follows: Tank, 3¾¢ @ 4¢; Boiler, 4¼¢ @ 5½¢.

Sheet Iron.—A little more activity is reported for light Sheets for Stove-pipe and similar seasonable work. The setting in of cooler weather causes an inquiry in this direction which may develop into better business from week to week for some time. Quotations on Galvanized Sheets range as follows: Best Bloom, 52½ % discount; Charcoal, 55 % discount; Refined, 57½ % discount, for small lots of a few bundles. Good-sized orders can be placed at about 2½ % better than these figures, while carload lots can be placed at about 5 % better. Prices of Black Iron show no change from those reported last week. Store prices will be found in our list of New York Wholesale Prices.

Merchant Steel.—Business in some directions is reported a little more active than it has been, but there is room yet for considerable development to reach the proportions of a fair trade. Prices show no change, being about as follows for small lots: American Tool Steel, 9½¢; Tool Steel of special grades and finer quality, 12¢ @ 20¢; Crucible Machinery, 5¢ @ 6¢; Spring and Tire, 3¢ @ 3¼¢; Open-Hearth Machinery, 3¢ @ 3¼¢; Bessemer Machinery, 3¢; English Tool, 14½¢ @ 15¢.

Steel Rails.—Negotiations are on foot for very large lots of Rails, amounting to about 50,000 tons in the aggregate. These Rails are on account of some leading Eastern railroad companies which have been in the market for some time and are now about closing their contracts. While the price of Rails has been held firmly for two or three weeks past, it is understood that these large contracts will be placed on about the same basis as the greater number of sales made this fall, which is from $27 to $27.50 at mill. Aside from these transactions there have been sales to the extent of about 16,000 tons, and inquiries are in hand for some 20,000 or 30,000 tons more. It is understood that the agreement to restrict production for the first half of next year has fallen through in consequence of the refusal of one of the companies to sign the agreement, alleging that contracts for deliveries and for the receipt of material have been made in such a way that to sign this agreement would subject them to serious inconvenience. The prices asked now range from $27 to $30 at Eastern mills; sellers at the lower rate, however, being very few in number.

Steel Wire Rods.—Business is stagnant, no inquiries being on the market. Nominal quotations are from $45 up, according to time of delivery.

Old Rails.—Sales are reported at Eastern ports at $16, and a lot of 600 tons was sold at a point on the North River at the same price, equal to $16.50 here. In this vicinity no transactions have recently occurred, but inquiries are more frequent and negotiations are pending that may result in sales of considerable quantities. Prices asked vary from $17 to $18, according to the quality and quantity of the Rails, but $16.50 @ $17.50 is probably all that could be realized.

Scrap Iron.—Sales to the extent of about 500 tons of No. 1 Wrought, from yard, are reported on private terms. Quotations range from $18.50 to $20, according to location of the yard.

The week has been unusually dull on the Metal Exchange, the only sales reported being the following, which were made on Tuesday, the 14th inst.: 10 tons Tin, December, 16.30¢, and 10 tons, same delivery, 16¼¢.

Aluminium nearly pure has a density of 2.786; its electric resistance is 1.96 times that of pure copper wire of the same length and diameter. For wires of equal length and weight the resistance of aluminium is a little less than that of pure copper. The addition of a small quantity of aluminium to copper largely increases both the mechanical and the electrical resistance.

Trade Report.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, October 14, 1884.

Pig Iron.—There is no new feature to report, the week's business having been much of the same character as during last week and several weeks immediately preceding. The position is certainly not any better than it was, and, while it has not retrograded to any appreciable extent, weak spots have been developed in a way that indicates a very unsatisfactory condition of affairs. Larger lots than usual have been taken, but in the majority of cases concessions have been made of more or less importance. In fact, it is clearly evident that up to this time there has been no positive check to the declining tendency of prices. Pauses there have been from time to time, but no reaction toward higher prices. No quotable change in prices can be made, but within the past 10 days sales of all grades of Iron have been made with modifications which in many cases have been in buyers' favor. The majority of transactions have, in fact, been of this character. Carload lots, and sometimes 50 to 100 ton lots, have been taken at quoted rates, but when larger lots are placed, special rates have to be made, according to brand, delivery, terms of payment, &c. Some well-informed parties express the opinion that the turning point is very near at hand, and, while that is by no means improbable, there are no indications of such an event at present. Sellers are anxious to find a market for their product, and buyers just as determined to take no more than required for immediate use, a condition of affairs which is manifestly anything but favorable for a better market. Sales during the week have been at about $19.50 @ $20 for No. 1 Foundry, $18 @ $18.50 for No. 2, and $16.50 @ $17 for Gray Forge, all delivered at tide. In some cases sales have been made at lower figures (probably 50¢ ₱ ton in most cases), while on choice brands from 50¢ to $1 premium has been paid above the ordinary rates.

Muck Bars.—Market very quiet, but sales of good Bars have been on the basis of $29 @ $29.50 at mill. Ordinary qualities at $28 @ $28.50, delivered.

Blooms.—Demand somewhat better, with prices as last quoted, viz.: Charcoal Blooms at $52 @ $53; Run-out Anthracite, $43; Scrap Blooms, $38; Northern Ore Blooms, $35.

Foreign Iron.—Nothing doing, although there has been some inquiry for 20 % Spiegel. Prices are nominal as last quoted: Bessemer at $19 @ $19.50; 30 % Spiegel at $32, 20 % at $26.50, and 10 @ 12 % at $23

Bar Iron.—Demand very light, and prices weak and irregular. For Best Refined Iron 1.85¢ @ 1.9¢ is quoted, and 1.6¢ @ 1.75¢ for Common and Medium qualities, but on desirable orders these figures have been shaded a trifle. There is no market for large lots, however, and business still continues of the same limited character as reported for several weeks past, with nothing to indicate any material change in the immediate future.

Plate and Tank Iron.—As in other departments of the Iron trade, there is nothing encouraging to report in regard to the Plate market. Consumers have very few orders on hand, and the amount of new business offering, even in a small way, is less than ordinary, so that the outlook is decidedly discouraging. The larger class of consumers, such as ship, bridge and tank builders, are rapidly completing their contracts, and at present see no probability of having them replaced; hence the absence of demand for Plates, &c. Prices are unchanged, and about as last quoted, viz.: Plate Iron, 2.1¢; Tank, 2.15¢ @ 2.25¢; Shell, 2.75¢; Flange, 3.75¢; Fire-Box, 4.25¢; Steel Plates, Flange, 3.5¢; Fire-Box, 4.25¢.

Structural Iron.—There is no demand of any importance, lots of 50 to 200 tons each comprising the bulk of the week's business. Some of the larger concerns have a considerable amount of work on hand yet, but the outlook as a whole is far from encouraging. Prices remain as last quoted: 2.1¢ for Angles, 2.25¢ for Bridge Plate, 2.75¢ for T's and 3.5¢ for Beams and Channels, subject to the usual discount on large lots.

Sheet Iron.—A fair trade in small lots is about all that is doing at present. The advent of cold weather is expected to stimulate the demand considerably, but in the meantime there is very little change to notice. For best makes about the following prices are obtained:

Best Refined, Nos. 26, 27 and 28	4 ¢
Best Refined, Nos. 18 to 25	3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 20 to 28	6¼¢
Best Bloom Sheets, Nos. 22 to 25	6
Best Bloom Sheets, Nos. 16 to 21	5¾¢
Common Red Plates, 3-16 to 16	2¼¢
Blue Annealed	2.6¢
Best Bloom, Galvanized, discount	50 %
Second quality, discount	53½ %
Common, discount	57½ %

Wrought-Iron Pipe.—There is some improvement in demand, but otherwise the situation is unchanged. Prices, if anything, are a trifle weaker, and the irregularity noticed for some time past continues. Nominally quotations are as follows: Butt-Welded Black Pipe, 45 %; Butt-Welded Galvanized, 35 %; Lap-Welded Black, 60 %; Galvanized, 45 %; Boiler Tubes, 57½ %

Steel Rails.—There has been less activity during the past week, owing to the unwillingness of large buyers to follow the advance demanded by manufacturers. At $27.50 @ $28 a considerable business could be done, but the nominal quotation for small lots is $29 at mill, with possible concessions of about 50¢ on large orders, when deliveries are favorable to seller. The upward movement appears to have met with a check, but there is no probability of reaction to the low prices which prevailed some time ago, as the mills are all pretty well supplied with orders for the winter months.

Steel Blooms.—There is still a very fair demand, but prices are a shade easier, although not quotably lower. Sales of small lots at last week's prices, viz.: Nail Blooms (Foreign), $35 at tide; Soft Basic Blooms, for special uses, $38 @ $40. Domestic Slabs, $36.50 @ $37.50, delivered.

Old Rails.—Buyers and sellers are wide apart in their ideas of values, so that only a very limited business has been done. Holders ask $18.50 @ $19, while buyers are hard to find at anything over $17.50, and at that price bids are not made with much freedom. Small lots have been taken at about $18, Philadelphia, or $18.50 @ $19, delivered.

Scrap Iron.—Demand slow at somewhat lower figures. Sales at about $19.50, f.o.b. cars, for choice No. 1, and ordinary qualities at $18.50 @ $19. Cotton Ties, $17.50 @ $18. Wrought Turnings, $15 @ $16; Cast Scrap, $15, and Cast Turnings, $10 @ $10.50.

Nails.—The demand is less active, and, while prices are unchanged, there is an improved feeling. Cutting has become less frequent and prices more uniform. Some mills are refusing orders at low figures, and to this is due whatever improvement there is in the market. We quote as last, viz., $2.10 @ $2.20, according to size of lot, &c.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., October 14, 1884.

The general business situation remains much the same as noted a week ago, with the exception that there is more politics than business. The firm of Oliver Bros. & Phillips have recalled the order asking for a reduction of from 10 to 12½ % on the wages of all their employees outside of the Amalgamated Association, and their mills, after being idle more than a week, have been started up at the old wages, although they say that they cannot promise steady work. While submitting to the will of their employees in this instance, they think the men would have fared as well in acceding to the reduction, as they would have been able to give them steady work, whereas, as it now stands, they cannot promise work full time. The mills here are paying considerably more for labor, both skilled and unskilled, than is being paid east of the mountains. The pay of laboring millmen here runs from $1.10 to $1.35 per day, mostly $1.25 to $1.35.

Iron Ore.—We hear of an occasional small sale, but, as a rule, business is exceedingly dull, and with so many idle furnaces, and the number still being increased, the prospect for an improvement is by no means encouraging. The indications at present are that there will be a very small consumption of Ore during the remainder of this year, as there is not much prospect of any of the idle furnaces being started up during the time in question.

Pig Iron.—Very little change in the situation during the past week; while the sales are nearly all small, there is a fair volume of business in the aggregate. There is little or no disposition on the part of consumers to anticipate future wants, and purchasers are no more anxious to contract for future delivery than consumers are to buy; the former are very well satisfied to sell in a small way to meet the immediate wants of the latter, as they reason that the market cannot get any worse and that there is a chance for improvement. As a number of the mills are running double turn the consumption is being increased, and with a continued light production furnacemen begin to think that they can see day breaking—that the dark cloud that has been hanging over this important interest so long is soon to be dispelled. We hear of a number of furnaces that are virtually out of the market, refusing to sell at present prices, although consumers have no trouble in obtaining all they want for present use within the range of our quotations. The market is inclined to harden, notwithstanding a very light demand. We quote as follows:

Extra No. 1 Foundry	$20.00 @	$20.50,	4 mos.
No. 1 Foundry	18.50 @	19.00,	4 "
No. 2 Foundry	17.00 @	17.50,	4 "
Neutral Gray Forge	16.00 @	16.50,	4 "
All-Ore Mill	17.50 @	18.00,	4 "
White and Mottled	14.50 @	15.00,	4 "
Cold-Blast, Charcoal	25.00 @	27.00,	4 "
Bessemer Iron	18.50 @	19.00,	4 "

Muck Bar—Continues very dull, and in the absence of reported sales we repeat former quotations—28 @ $29, cash, at mill.

Manufactured Iron.—The general Merchant Iron trade continues dull for the season, although some firms report an improvement in orders during the past week; very few of the regular Bar mills working full, some few standing idle. We continue to quote prices on a basis of 1.65¢ @ 1.75¢ for Bars, 60 days, 2 % off for cash. As stated in our last, Pittsburgh is doing but comparatively little at Chicago, St. Louis and other points West, because our manufacturers are refusing to sell at the prices obtainable. There is considerable doing in Skelp Iron, some of the mills running double turn, and prices are firmer. We now quote at 1.8¢ @ 1.85¢; we hear of an order having been rejected at 1.77½¢. There is also a fair trade in Structural and Bridge Iron.

Nails.—There is a fair trade, although orders are mostly small, indicating that buyers are still apprehensive of lower prices, and the market, both here and at Wheeling, may be quoted steady at $2, 60 days, 2 % off for cash, in car lots and upward, and 5¢ @ 10¢ ₱ keg additional in a jobbing way. Steel Nails 15¢ ₱ keg more than Iron Nails. The indications are that Steel Nails will to a considerable extent supplant the Iron Nail before a great while, although there are those who contend that the latter, in most respects, is equal to the former.

Wrought Iron Pipe.—There is a very fair degree of activity; the mills appear to have about all they can do. During the week under review a couple of good-sized contracts were made—one with the National Tube Works, of this city, for 20 miles of 8-inch gas-pipe, and the American Works, at Middleton, Pa., secured a contract of same kind and for same quantity. Prices continue irregular, and cutting is still in order. Discounts are quoted as follows on desirable orders: Butt-Welded Black Pipe, 45 %; do., Galvanized, 35 %; Lap-Welded Black Pipe, 65 %; do. Galvanized 45 %. Boiler Tubes, 57½ @ 60 %; Two-inch Oil-Well Tubing, 12¢ ₱ foot, net; 5⅝-inch Oil-Well Casing, 40¢ ₱ foot, net. For Selected Pipe or Pipe cut to specified lengths, discount 5 % below rates quoted.

Steel.—There is nothing new to note save that the consumption of the cheaper grades is steadily increasing, for many purposes taking the place of Iron. Standard brands of Refined Cast Steel 9¼¢ @ 10¢; Crucible Machinery, 5¢ @ 5½¢; Bessemer and Open-Hearth do., 2¾¢ @ 3¢. Steel Nail Slabs, the demand for which is increasing, quoted at $30 @ $31 ₱ ton.

Steel Rails.—The market is much firmer, and $29, cash, at mill, is now quoted as the ruling price here for heavy sections. The Edgar Thomson is now the only mill here making Rails, the Pittsburgh Bessemer Works being engaged on Steel specialties and to much better advantage than making Rails. The latter works, among other specialties, are giving considerable attention to Nail Slabs. Steel Rail Ends still quoted at $17.50 @ $18, cash.

Railway Track Supplies—Continue very dull, with but little prospect of any immediate improvement. Spikes quoted at 2¢, 30 days; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2⅜¢ @ 2⅝¢ ₱ lb.

Old Iron Rails—Continue dull, and in the absence of sales we continue to quote at $20.

Old Steel Rails—Are quoted at $17 @ $18 ₱ ton for mixed lots.

Scrap.—The Scrap trade continues dull, and there is so little doing that it is difficult to give reliable quotations. Wrought Scrap is nominal at $18 @ $19 ₱ net ton; Wrought Turnings, $14 @ $15; Old Car Axles, $25 @ $27; Cast Borings, $12 @ $12.50, gross; Old Car Wheels, $16.50 @ $17, gross.

Window Glass.—There is a fair trade, but prices unsatisfactory. Discounts quoted as follows: In car lots, 70 and 5 % on Single and 75 % on Double.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St., Cor. Lake St., CHICAGO, October 13, 1884.

Hardware.—The market during the past week was less active than for several preceding weeks. Orders are reduced in number to such an extent that jobbers can fill them promptly and keep their business in even motion. The decline in demand is attributed to the weather, which is warm for the season, and the irregularity in prices which has sprung up during the past fortnight. Retailers are pretty well supplied with fall and winter goods, for which they as yet have had a light call from consumption. The weakness in price on the various lines of Sheet stock forbids unnecessary purchasing, and again reduces the demand to actual consumption. This feature of the market, however, is regarded as only temporary. It is generally conceded that with colder weather trade will be heavier than has yet been experienced. Prices are giving jobbers considerable trouble. Each new circular that is issued reduces the price on one or the other line of articles, regardless of profit. How and when this rivalry in cutting prices can be stopped is becoming a perplexing question.

Barb Wire.—The market continues pretty steady, and in about the same position that has characterized it during the past month. Buying is light for the season, and chiefly in small lots. Notwithstanding the low price at which Wire is selling, and the statements that it is a safe investment, there is no disposition to buy except for immediate consumption. Galvanized is quoted at 5¼¢ and Painted at 4¼¢ to all buyers, but considerable Wire is being sold at ⅛¢ less by nearly, if not all, jobbers. Makers are not desirous of making a price for car lots, but it is not unlikely that an additional discount could be had. Another meeting was held by the manufacturers last week, when they adjourned to meet again this week. The committee appointed to secure signatures to the *modus operandi* in restricting production and regulating prices have not yet completed their work.

Nails.—The demand for Nails is of an irregular character, and for consumption that cannot be deferred. Carload buyers are out of the market, except when bought for reselling by country merchants, in from 5 to 20 kegs at a time. Car lots are quoted at $2.15, 2 %, 60 days, and sales are reported at a fraction below these figures. For sales of less quantity $2.20 is quoted, but in exceptional cases this price has been discounted. The market has no strength, and sales are made at times which have no bearing upon the price of an order for Nails alone.

American Pig Iron.—The market during the past week has been perhaps a trifle less active. The late conditions of the market and the firmness which furnacemen have displayed in supporting their prices, have been somewhat unexpected by consumers. Some of the more wary made haste to secure their supply before the market advanced, while others deferred their purchases, thinking that the advance was all talk and would soon blow over. From appearances in this they were disappointed, and the week has shown up more "shopping" for concessions than has been seen for some time. The purchaser is now doing the hunting that heretofore has been done by the seller. Charcoal Irons are pretty well sold up, and makers are not anxious to push further sales. In the hope that prices will again relax, buyers are taking temporary supplies for direct consumption. Since prices have strengthened, other elements have come to light. Inquiries for prices on larger blocks of Iron from parties who are acknowledged speculators are not unusual, though no sales for this purpose are as yet reported. The position of Southern Iron is much the same. The curtailment among Southern furnaces has not been so great, and therefore the supply is more abundant and less likely to be taken up for speculation. We hear of sales of Southern No. 2 in this city at quoted prices. One lot of Bessemer Pig was offered at $16, cash, and not sold, the party to whom the offer was made having no need of the Iron. This class of Iron seems to be weaker than any of the others. At present writing there is every reason to believe that the market is in a better position than at any previous time this year, and that a steady improvement can be looked for. We make the following quotations on carload lots, four months: Lake Superior Charcoal, Nos. 1, 2 and 3, $21.50; Nos. 4, 5 and 6 at $22; Lake Superior Coke at $20; Lake Superior and Ohio, mixed, at $20 @ $21; Ohio Standard Black Band, No. 1, at $21; Southern, No. 1, at $18; No. 2 at $17.50; Silvery Soft at $17.50 @ $19 50; Anthracite, No. 1, at $21, and No. 2 at $20.

Scotch Iron.—Buying in Scoth Iron for the week has been very light. Dealers are holding stocks on hand pretty firmly, in view of the foreign advance. Quotations, which are as follow, are unchanged: Summerlee, $25.50, cash, from yard, and $24.50 to arrive; Glengarnock, $25.50 from yard, and $24 to arrive.

Merchant Steel.—Makers of good established qualities report a firm trade, while others complain that business is dull. The irregularity and weakness in prices which have ruled so long have totally destroyed what might be termed a market. Each maker endeavors to get as much for his stock as possible, and the quality required for the purpose intended determines the sale. For Refined grades from store we make the following quotations:

	Per pound.
Best Refined Cast Tool Steel	8¼ @ 9¼¢
Crucible Cast Machinery Steel	5½ @ 6¢
Open-Hearth and Bessemer Steel	3 @ 3½¢
Open-Hearth Spring Steel	3¼ @ 3½¢
Toe-Calk Steel	3¼ @ 3½¢
Fire-Box and Boiler Steel	4¼ @ 5 ¢
Syndicate Steel	7 @ 7½¢

Steel Rails.—The demand for Rails is reported as being very light. The lowest price that we hear quoted is $30 at mill. No sales have been made within the week that would change this quotation. Brokers claim that Rails cannot be bought for less than $30.50 @ $31, f.o.b. Chicago.

Old Rails.—Market for Old Rails is rather quiet. There is some demand for small lots, which are quoted at from $17.75 to $18.50. One lot of 100 tons was sold at a point out of the city at the former price. Holders continue to ask $19 @ $20 on cash sales.

Structural Iron.—Nothing that has developed since our last report alters the position of the Structural Iron market. Mills are still engaged on former contracts, and the prospect of additional demand is more than good at present. We continue following quotations, with ¼¢ @ ½¢ added for delivery from stock: Beams, $3.60; Channels, $3.60; T Iron, $3; Angle Iron, $2.50; Flitch Plates, $2 50; Frieze Plates, $2.70.

Bar Iron.—The market for New Puddled Iron continues steady and without change in price. Buyers of 1000-ton lots do not seem so numerous as some time ago, but sales amounting to 50 and 100 and 200 ton lots are not unfrequent. For New Puddled Best Refined we continue to quote $1 85 @ $1.90. Common Iron is fairly active in a small way. The weakness in price deters buying in large quantity. From store it is quoted at $1.70 @ $1.80, as heretofore. Ulster Iron is quoted at $3.65 @ $3.75.

Norway Bars—For Merchant trade $3.75 is quoted, and to consumers 4¢ rates. Demand slightly better than for several weeks past.

Galvanized Iron.—The strong competition for trade between the syndicate and those who were not members has been the cause of entirely breaking the combination, which dissolved last week. Some of the makers who were not in the association have been securing a large proportion of the trade, either through lower prices or on account of syndicate restrictions that placed the members at a disadvantage. No cutting has been reported beyond the 2 % noted last, and it is believed that the narrow margin now left to those who must buy the Black Sheets will prevent any great change in prices. We continue the following quotations as jobbers prices: Juniata, 55 % off; Charcoal, 57 % off, and Refined, 60 % off.

Black Sheets.—While there is a fair market for Sheet Iron, there is not the activity that was anticipated. Mills are not quite so determined as some weeks ago, and jobbers say they have been favored in placing orders for their fall and winter trade. Makers are unwilling to concede these points, and say that they will not meet the demands of jobbers. It is stated that $2.85, f.o.b. Pittsburgh, was refused for car lots of No. 26, and bought for considerably less from another quarter. We make the following quotations from store: Nos. 10 to 14 at $2.60 @ $2.70; No. 24 at $2.80; Nos. 25 and 26 at $2.90, and No. 27 at $3.

Old Wheels.—No change is announced in the condition of the market for Old Wheels. Foundries continue to quote $16.50 @ $17, while holders are asking $18.50; consquently, a dull market is the result.

Scrap Iron.—The demand for Scrap is certainly very light. The market shows weakness upon the least attempt to force sales, and dealers prefer to pile it up in their yards. Mills are quoting $15 @ $16.50 for No. 1, and $11 for No 2. We make the following quotations as dealers' purchasing prices: No. 1 Wrought Scrap, ₱ net ton, $14.50; Cast Scrap, ₱ net ton, $12; No. 1 Stove-Plate Scrap, ₱ net ton, $8; Wrought Turnings, ₱ ton, $8; Cast-Iron Borings, $6; Old Plow Steel, $9; Tool Steel, ₱ ton, $15; Locomotive Steel Tire, ₱ net ton, $13; Buggy Springs, ₱ net ton, $14.50; Malleable Scrap, $5.

EVERETT & POST, 156 Lake street, Chicago, report to us as follows, under date of October 13, 1884: *Pig Lead*—Since our last report the Lead market has shown a little weakness, owing to a very high consumptive demand. There have been sales of Common Lead in a small way at $3.55 @ $3.57½, but we hear of no Refined offering below $3.57½ @ $3.60. Business is only of a jobbing character; no large lots offering, and none saleable, even if they could be had. In a general way we should say the present apathy in trade is caused principally by uncertainty regarding the coming election. Stocks in hands of refiners and consumers are small, and a settlement of political issues will, we think, have a tendency to improve trade, and, while we may see lower values for Lead in the interim, we would advise our friends not to wait too long before buying.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., CHATTANOOGA, October 13, 1884.

The hot weather has been replaced by a cool wave extending over the South, but the section is still afflicted with severe drought, which has now continued nearly two months. Cattle and other stock are being shipped out of the mountain districts to obtain pasturage, and in large districts farmers are hauling water several miles for stock and house use. Between the drought and politics, business is kept dull. No revival of any consequence is looked for. Labor continues fairly well employed. Manufacturers generally are strong financially, and thus in good shape to profit by an improvement in prices.

Pig Iron.—There continues a stronger demand for the best grades, which are stil scarce. Holders are slow to contract for winter and spring delivery at less than $18 for No. 1 Foundry. We quote large lots, for cash, $13 @ $14 for Mill, and $16 @ $16.50 for Foundry. We continue to quote small lots, 60 days: No. 1 Foundry, $17 @ $18; No. 2 Foundry, $16.50; Gray Forge, $14 @ $15; White and Mottled, $13 @ $14; Car-Wheel Metal, $22 @ $24.

Ores.—We quote Fossiliferous Ores, averaging about 50 % Metallic Iron, $1.50 ₱ ton, delivered at river landings; higher qualities, $2. Brown Hematite, $2 @ $2.25 on cars at furnace.

Miscellaneous Articles.—Buyers of all materials are not plenty, except at their own terms. We quote Old Rails at $16; Old Wheels, $16; Wrought Scrap, No. 1, $14; No. 2, $11; Cotton-Tie Clippings, $10.

Merchant Iron.—Bar is steady at $1.70 for round assorted bills; Spikes, $2.25; Bolts, $2.50 @ $2.75; Splices, $1.70, with very little doing in any of the list.

Nails.—We quote Nails steady at $2 @ $2.15 for large bills, $2.25 from stores.

Barb Wire.—Cambria Link and Four-Point Galvanized, 6¢ ₱ lb.

Coal.—Further evidence of disintegration of the Southern Coal pool has come out since our last report. Several mills have practically withdrawn, and others will probably follow. The operators are too far scattered, their rates of transportation too varied, and their interests too apt to clash, for the combination to last. We quote Fancy Lump at $3; Common Lump, $2; Egg, $2.25, de-

livered. Run of mine to manufacturers, $1.50 at mines.

Coke.—We quote at $2 @ $2.25 at ovens; Foundry Coke at 8¢ @ 10¢ ℔ bushel.

Cincinnati.

OCTOBER 13, 1884.—*Pig Iron.*—The market remains without new life; some little pressure to sell round lots in the past week resulted only in demoralizing the prices on car lots, supplying the from hand-to-mouth trade. Producers and consumers are waiting for "something to turn up." Quotations:

CHARCOAL FOUNDRY.

Hanging Rock, No. 1	$21.50 @	....
Hanging Rock, No. 2	20.50 @	....
Tennessee and Alabama, No. 1	19.50 @	....
Tennessee and Alabama, No 2	18.50 @	....
Lake Superior, No 1	22.00 @	....

COKE FOUNDRY.

Hanging Rock, No. 1	18.25 @	....
Hanging Rock, No. 2	17.50 @	....
Virginia, Tennessee and Alabama, No. 1	17.50 @	...
Virginia, Tennessee and Alabama, No. 2	16.00 @	....
Eastern Ohio and Pennsylvania, No. 1	19.00 @	....
Eastern Ohio and Pennsylvania, No. 2	18.00 @	....

SILVER GRAY SOFTENERS.

Hanging Rock, No. 1	18.75 @	....
Hanging Rock, No. 2	16.75 @	...
Hanging Rock, No. 3	15.75 @	...
Others	17.50 @	15.50

CAR WHEEL.

Hanging Rock, Charcoal Cold Blast	26.50 @	29.00
Others, Charcoal Warm Blast	22.00 @	25.50

FORGE.

Stonecoal, Coke and Charcoal	20.00 @	15.50

Louisville

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, Louisville, under date of October 13, 1884, report as follows: *Bar Iron* is somewhat firmer. One or two mills to which this market is tributory that were making low prices have shut down suddenly, if not unexpectedly, and declared all contracts off. As they have no stock to carry or sell, this move drives purchasers into new channels. Mills in operation must not expect a boom, however, as November and December, proverbially dull months, are close upon us, as is also the election, with its perturbing influences. *Sheet Iron* is dull, with little inquiry. The change in temperature of the last day or two to seasonable coolness is expected to improve the demand for Stove-pipe gauges. *Hoops and Bands.*—The association has formally made a reduction of one-tenth, a decline discounted some time since. *Nails* are active, as is usual in October, but they are still weak, and there is no relief in sight so long as the factories persist in running full. Some lately idle, like Belmont and Benwood, are again running full time. Steel Nails continue to meet with increased favor, as their quality has been manifestly improved. Those factories having their own Steel plants and securing a nearly absolute uniformity in analysis claim several advantages over those who propose to buy their Plate. If this be the fact, a sale will resolve itself into a question of brand, and only those find acceptance that are known to first class. Prices, however, are bound to be more or less demoralized. *Wire* is still dull. The fall trade for Fencing has been a disappointment all around to the manufacturer and dealer alike. There is no firmness to the market, but a general anxiety to sell. Trade at large is not improving, and collections are notoriously slow; at the same time, while the agricultural classes are as prosperous and solvent as they certainly are, we cannot lose altogether our faith in the future.

GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of October 13, 1884: The market continues firm. The large surplus stock which had accumulated at furnaces has, since August 1, been greatly reduced, and most producers have sold more since that time than they have made. They are, consequently, holding prices firm, and the tone of the market is improved.

PIG IRON.

Southern Coke, No. 1 Foundry	$18.00 @	....
" No. 2 "	16.50 @	....
Hanging Rock Coke, No. 1 Foundry	18.00 @	18.50
Hanging Rock Charcoal, No. 1 Foundry	22.00 @	23.00
Southern Charcoal, No. 1 Foundry	18.50 @	19.00
Silver Gray, different grades	16.00 @	17.00
Southern Coke, No. 1 Mill, Neutral	15.00 @	....
" No. 2 " "	14.00 @	....
" No. 1 " Cold-sh't	14.00 @	14.50
Southern Charcoal, No. 1 Mill	16.50 @	18.00
White and Mottled, different grades	13.00 @	13.50
Southern Car-Wheel, standard brands	25.00 @	26.00
Southern Car-Wheel, other brands	22.00 @	24.00
Hanging Rock, Cold-blast	25.00 @	26.00
" Warm-blast	21.00 @	22.00

St. Louis.

HOFFER & Co., of St. Louis, report to us as follows, under date of October 13, 1884: The market is looking up a little, but not enough to warrant any change in prices. We therefore continue quotations same as last week:

HOT BLAST CHARCOAL IRONS.

Missouri	$16.00 @ 17.00
Southern	16.00 @ 17.00
Ohio	20.00 @ 22.00

COAL AND COKE IRONS.

Missouri	16.00 @ 17.00
Southern	18.00 @ 19.00
Ohio	20.00 @ 22.00

MILL IRONS.

Red-short	15.50 @ 16.00
Neutral	15.00 @ 16.00

CAR WHEEL AND MALLEABLE IRONS.

Missouri	18.00 @ 20.00
Southern	26.00 @ 27.00
Ohio	28.00 @ 30.00

Baltimore.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of October 13, 1884: Trade for the past week has ruled much the same as last reported, both manufacturers and dealers seemingly willing, in order to induce business, to shade current figures.

We quote the market quiet, with values shading annexed quotations:

Ref. Bar Iron, 1 to 6 x ¾ to 1	℔ lb 1 9-10 @	2 ¢
" " 1 to 4½ x 1½ to 1	℔ lb 1 9-10 @	2 ¢
" " ¾ to 2, Round and Square	℔ lb 1 9-10 @	2 ¢
Hoop Iron, 1½ wide and upward	" 3¼ @	3 ¢
Band Iron, from 1½ to 6 in. wide	" 2½ @	2 6-10¢
Horse-shoe Iron	" 3 1-10 @	3 2-10¢
Norway Nail Rods	" 5 @	5¼ ¢
Black Diamond Cast Steel	" 10 @	11 ¢
Machinery Steel	" 4½ @	5 ¢
Spring Steel	" 4 @	4¼ ¢
Common Horse Nails	" 10 @	11 ¢
Railroad Spikes, 5½ x 9-16	" 3½ @	2 6-10¢
Perkins's Horse Shoes, ℔ keg of 100 lb		$3.87½
" Mule Shoes		4.87½

Imports and Exports.

IMPORTS.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending Oct. 14, 1884:

Hardware.

Alexandre F. & Sons, Guns, cs., 9
Blake Bros. & Co. Machinery, cs., 1
Baker, Pratt & Co. Cases, 7 Mdse., cs., 7
Boker Hermann & Co. Hdw. and cutlery, pkgs., 138 Chains, cks., 14
Bradley & Currier, Cases. 45
Brown Bros. & Co. Cases, 12
Burkinshaw W. C. Cases. 2
Clark A. G. & Bro. Machinery, cs., 8
Carey Samuel, Cases, 12
Calhoun, Robbins & Co. Cases, 7
Campbell H. P. Nails, bags, 5 Cases, 4
Curley J. & Bro. Cases, 2
Degrauw, Aymar & Co. Chain, cks., 2 Chain, lengths, 17
De Castro —, Machinery, cs., 4
Dieckerhoff, Raeffloer & Co. Cases, 3
Davies, Turner & Co. Pkgs., 4
Drexel, Morgan & Co. Guns, cs., 65 Cases, 2
Folsom H. & D. Guns, cs., 11
Field Alfred & Co. Cask, 1
Guns, cs., 20 Cases, 6
Frasse P. A. & Co. Pkgs., 4 Mdse., cs., 2
Guina & Co. Printing mach., cs., 1
Graef Cutlery Co. Mdse., cs., 3
Grubb Jos. C. & Co. Arms, cs., 2
Gerdan Otto, Pkgs., 84
Godfrey C. J. Case, 1
Gurney F. B. Cases, 4
Hartley & Graham, Guns, cs., 12
Jennings A. G. & Sons, Machinery, cs., 10
Kitching T. E. & Co. Machinery, cs., 6
Merchant's Disp. Co. Chains, ck., 1 Case, 1 Guns, cs., 5 Machinery, pcs., 36
Moore's Sons J. P. Guns, cs., 17
Moss F. W. Files, cks., 3
Rosenberg R. Plows, 7
Rosenthal J. & Co. Cases, 2
Siebe, Garman & Co. Machinery, pkgs., 2
Squires W. C. Guns, cs., 3
Schoverling, Daly & Gales. Cases, 39 Guns, cs., 36
Taylor Bros. Cases, 11
Thebaud Bros. Machinery, cs., 5
Vom Cleff & Co. Mdse., cs., 8
Wiebusch, Hilger & Co. Hdw. and cutlery, pkgs., 101
Windmuller & Roelker, Arms, cs., 6
Witte John G. & Bro. Cutlery, cs., 2 Guns, cs., 10 Needles, cs., 2
Order. Chain, ck., 1 Cases, 4 Machinery, cs., 1 Pkgs., 4

Iron.

Baring Bros. & Co. Bdls., 859 Bars, 2063 Rods, coils, 934 Wire rods, pkgs., 5658
Brown Bros. & Co. Bars, 2076 Bdls., 202 Rivet rods, coils, 156
Coddington T. B. & Co. Sheets, bdls., 1088
Crocker Bros. Spiegel, tons, 214 Ferro iron, tons, 83 Pig, tons, 200
Irwin Richard & Co. Pig, tons, 200
Jackson & Co. Bdls., 43
Lillienberg, N. Wire rods, bdls., 328
Mackenzie Capt. Chain, cable, 1 Shackles, 2
Mason J. W. & Co. Wire rope, reels, 2 Wire rope, coils, 2
McComb J. J. Cotton ties, bdls., 4483
Naylor & Co. Spiegel, tons, 100 Bars, 56
Phelps, Dodge & Co. Sheets, bdls., 50
Pierson & Co. Sheets, bxs., 708
Raynor G. W. Wire, cs., 20
Stetson Geo. W. & Co. Pig, tons, 215
Ward A. H. Pig, tons, 200
Windmuller & Roelker, Sheets, pkgs, 300
Order. Castings, ck., 1 Wire rods, bdls., 15,838 Scrap, tons, 127 Cotton ties, bdls, 28,950 Ore, tons, 505 Hoops, bdls., 169 Bars, 121 Plates, 36 Rods, pkgs., 15,736 Galv. rods, pkgs., 200 Wire, coils, 2746 Bdls., 201 Rivet rods, coils, 180 Wire rods, coils, 1086 Rods, coils, 7815 Pig, tons, 150

Steel.

Abbott Jere & Co. Cases, 34 Bundle, 1 Wire rods in coils, bdls., 7 Cases, 39
Baldwin Bros. & Co. Bars, cs., 5
Baring Bros. & Co. Rods, coils, 12,170
Brown William, Pkgs. and pcs., 140
Cary & Moen, Coiled rods, bdls., 440
Downing R. F. & Co. Bundles, 440
Lazard Freres, Wire, pkgs., 383
Morton, Bliss & Co. Soft steel, sheets, bdls., 97 Galv. sheets, bdls, 65
Moss F. W. Bundles, 32 Bars, 13
Naylor & Co. Rods, tons, 160¼ Rods. bdls., 32 7 Billets, 446 Bars, 776 Bundles, 83 Scrap, tons, 20¾
N. Y. Dyeing & Printing Co. Engraved rollers, cs., 3
Wagner W. F. Bundles, 232 Bars, 34 Cases, 12
Order. Bands, 200 Steel rods, coils, 1478 Rods, bdls, 2612 Bundles, 444 Old railway leaf spring, tons, 120 Cases, 5 Casks, 2 Strips, cks, 18 Bars, 48 Forgings, 16 Rail cross ends, tons, 300

Metals.

American Spelter Co. Tinned plates, bxs., 139
Adamson, Gilfillan & Co. Tin slabs, 434
Baring Bros. & Co. Tin plates, bxs., 435
Bank of Montreal, Tin plates, bxs., 359 Tin and terne plates, bxs., 161
Boker Hermann & Co. Cartridges, cs., 4
Bond, Parsons & Co., Copper ore, tons, 1950
Crooks Robert & Co. Tin plates, bxs., 5944
Carter, Hawley & Co. Tin slabs, 307
De Witt H. R. & Co. Tin plates, bxs., 656
Dickerson, Van Dusen & Co. Tin plates, bxs., 3824
Field Alfred & Co. Gun caps, cs., 6
Hardwick Bros. Lead, pigs, 942
Hunt John. Lead pipe, cks., 34
Leaycraft & Co. Y. M. sheath'g, cs., 6 Metal nails, kegs, 2
Moore's Sons J. P. Gun caps, cs., 13
Munn & Co. Rowlocks, bx., 1
Naylor & Co Tin plates, bxs., 532
Phelps, Dodge & Co. Tin plates, bxs., 9770
Richardson W. S. Old metal, pkgs, 5
Straus A. D. & Co. Old copper, pkgs., 16
The United Brass Co. Case, 1
Tryon E. E., Jr., Gun caps, cs., 10
Witthe & Smillie, Tin, slabs, 458
Order. Tin pl'ts, bxs., 17,103 Tin plates and taggers, bxs., 607 Tin slabs 9520 Quicksilver, bot., 500 Antimony, cks., 5 Lead, pigs, 500 Terne plts., bxs., 875 Tin and terne, bxs., 425 Spelter, ingots, 1945

The imports of Cutlery, Hardware and Metals for the week ending October 10 were as follows:

	Quantity.	Value.
Antimony	100	$5,736
Brass goods	35	2,534
Bronzes	65	10,328
Chains and anchors	1	51
Copper	....	331
Cutlery	79	20,819
Guns	117	14,005
Hardware	6	262
Iron, pig, tons	985	14,257
Iron, sheet, tons	311	45,642
Clocks	96	11,898
Iron, ore, tons	625	1,444
Iron, other, tons	1,722	44,469
Machinery	71	3,802
Metal goods	141	16,824
Nails	239	842
Needles	5	3,210
Nickel	13	3,905
Old metal	....	1,641
Plateware	7	752
Pins	10	860
Plumbago	195	1,704
Saddlery	11	2,427
Steel	5,770	21,087
Tin, boxes	35,568	149,053
Wire	724	8,881
Zinc, lbs	28,451	1,190

The following is a comparison with previous dates:

	For the week.	41 weeks of 1884.	Same time 1883.
Cutlery, pkgs	79	4,208	6,140
Hardware, pkgs	6	561	921
Iron, R. R., bars	....	9,422	10,642
Lead, pigs	....	29,653	8,589
Steel, pkgs	5,770	1,416,998	2,420,470
Tin, bxs	35,568	1,560,563	1,688,736
Tin slabs, lbs	....	18,660,892	18,841,585

EXPORTS.

The following were the Exports of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending October 14, 1884:

Danish West Indies.

	Quan.	Val.
Hdw., cs	4	$79
Ptlm., gals	2073	252
Bells	2	35
Torpedoes, cs	10	30

Dutch East Indies.

Ptlm., gals	815,200	81,500

Antwerp.

Ptlm., gls	1,256,009	99,168
Copper, casks	703	52,450
Sew. ma. cs	300	4,698
Hdw., cs	6	306
Ag. imp., pkgs	2	80
Clocks, cs	3	31
Mach'y, pkgs	6	650

Hamburg.

Hdw., pkgs	85	1,647
Mf. iron, pkgs	7	770
Clocks, pkgs.	7	137
Ag. imp., pkgs	8	400
Door spr'gs, cs	24	800
Sew. ma., cs	820	18,780
Copper bars	14	1,800
Mach'y, pkge.	1	400

Bremen.

Ptlm., gals	455,325	30,888
Ag. imp., pkgs	22	678
Chains, bbls	6	150
Hdw., cs	13	340

Rotterdam.

Ptlm., gals	151,349	12,108
Mach'y, pkgs.	13	1,340
Ag. imp., pkgs	10	753
Mf. iron, pkgs	5	102
Pumps, pkgs.	6	275
Copper, cks	103	16,740
Sew. ma., cs	212	4,650

Elsinore.

Ptlm., gals	254,717	20,850

Amsterdam.

Ptlm., gals	279,861	22,388
Hdw., cs	2	67

Liverpool.

Guns, cs	2	265
Cop. mat., bgs	6817	40,000
Brass gds., cs	8	1,045
Iron safe	1	250
Ag. imp., pkgs	88	1,750
Mach'y, pkgs.	30	4,551
Platinum, box	1	3,500
Sew. ma., cs	72	2,396
Pistols, case	1	300
Copper, pigs	924	14,891
Copper, hhds.	14	50
Clocks, pkgs	354	7,832
Wrenches, cs	67	900
Pumps, pkgs.	2	134
Steam pump	1	450
Mf. iron, pkgs	97	1,017
Cop. ore, sks	25	150
Hdw., cs	176	3,705
Scales, cs	8	392
Needles, case	1	192
Saws, cs	12	130

Hull.

Hdw., pkgs	73	1,516
Ag. imp., pkgs	3	123
Clocks, pkgs	190	1,455
Mach'y, pkge.	1	50

Bristol.

Eyelets, cs	2	102
Ptlm., gals	848,050	29,350

London.

Sew. ma., cs	48	1,488
Firearms, cs	2	200

Gibraltar.

Ptlm., gals	60,000	5,500

Dublin.

Ptlm., gals	141,898	11,706

Glasgow.

Hdw., pkgs	10	261
Nails, cs	200	600
Grain mill, cs	5	300
I. pipe, pcs	95	3,010
Pumps, pkgs.	5	216
Ag. imp., pkgs	5	502
Sew. ma., cs	315	5,428
Clocks, pkgs	12	350
Mach'y, pkgs.	9	879
Steel, cs	7	500
F. arms, cse	1	48

British West Indies.

Clocks, pkgs.	6	184
Zinc, casks	3	104
Tinware, cs	15	178
Cartridges, cs.	6	178
Revolvers, cs.	2	217
Scales, cs	27	130
Ptlm., gals	34,659	3,594
Hdw., pkgs	72	1,235
Mf. iron, pkgs	55	1,156
Ag. imp., pkgs	17	122
Mach'y, pkgs.	39	1,778
H. shoes, kegs	19	109
Nails, kegs	132	566
Sew. ma., cs	6	99
Cutlery, cs	9	137
Nails, cs	26	81
Pumps, pkgs.	3	27
Anchor	1	25
Iron, bars	20	9
Yel. met'l., cs	5	424

British Guiana.

Ptlm., gals	12,000	1,343
Mach'y, pkge.	1	50

New Brunswick.

Ptlm., gals	5000	525

Newfoundland.

Ptlm., gals	105,600	10,560
Sew. ma., cs	30	419
Mf. iron, pkgs	97	197
Clocks, pkgs.	3	222
Mach'y, pkgs	62	460
Hdw., pkgs	4	238

Nova Scotia.

Hdw., pkgs	7	175
Ag. imp., pkgs	28	88
Buoy	1	1,600
Mf. iron, pkgs	86	322
Ptg. press	1	500
Ptlm., gals	18,025	1,875
Cutlery, pkgs	2	27

British West Indies.

Ptlm., gals	220,000	21,175

Hong Kong.

Hdw., case	1	40

Bordeaux.

Ptlm., gals	99,538	7,099

Seville.

Ptlm., gals	142,880	11,800

Pasages.

Ptlm., gals	194,500	16,775

Constantinople.

Ptlm., gals	196,000	19,110

	Quan.	Val.
Ptlm. gals	400	41
Cutlery, cs	2	33
Nails, kegs	30	66
Mach'y pkgs.	4	72
Hdw., pkgs	7	126
Clocks, pkgs.	8	582

Brazil.

Mf. iron, pkgs	394	1,901
Hdw., pkgs	26	461
Nails, kegs	155	611
Ptlm., gals	330,294	31,439
Car wheels	290	1,680
Clocks, pkgs.	29	741

Spanish Possessions in Africa.

Ptlm., gals	10,000	975
Mach'y, pkgs.	2	80

Genoa.

Sew ma., cs	64	1,026
Hdw., cs	24	394
Pumps, pkge.	1	9
Ag. imp., pkgs	6	52

Cuba.

Cutlery, cs	25	387
Mach'y, pkgs.	175	9,537
Mf. iron, pkgs	241	1,551
Retorts	9	233
Copper, sheets	10	1,307
Wire netting, pkgs	7	365
Saws, cs	3	241
Iron, pkgs	196	680
Steel, piece	1	38
Sew. mch., cs.	9	407
Steam pumps	2	1,900
Nails, pkgs	13	152
Cop. tubes, cs	60	5,639
Nails, kegs	188	558
Hdw., pkgs	84	1,434
Cop. rods, cs	2	355
Car wheels	190	1,578
Quicksil., flsks	2	64
Scales, pkgs	51	949
Ptlm, gals	295,106	24,361
Ag. imp., pkgs	7	212

French West Indies.

Ag. imp., pkge	1	9
Hdw., case	1	14
Sew. mch., cs.	2	38
Ptlm., gals	15,000	1,450

Cette.

Ptlm., gals	216,853	15,451

Havre.

Copper, casks	269	43,700
Ptlm., gals	303,213	21,604

Marseilles.

Ag. imp., pkgs	2	52

Porto Rico.

Ptlm., gals	41,487	3,879
Hdw., pkgs	21	494
Mf. iron, pkgs.	14	186
Cannon	1	350
Pumps, pkgs.	2	58
Nails, kegs	12	31
Clocks, pkgs.	8	182
Cutlery, cs	3	31
Mach'y, pkgs.	5	179
W. closet	1	87
Bell	1	41
Buoy	1	32
Railroad bars	443	1,007
Ag. imp., pkgs	11	380

Cape Verde Islands.

Clocks, pkgs	3	103
Ptlm., gals	2000	190
Nails, kegs	30	87
Hdw., pkgs	12	184

Mexico.

Hdw., pkgs	51	1,177
Clocks, case	1	61
Nails, cs	2	10
Per. caps, case	1	20
Nails, kegs	46	116
Ptlm., gals	15,500	1,637
Cartridges, cs.	50	651
Pumps, pkgs.	20	493
Ag. imp., pkge	11	180
Revolvers, cs.	3	447
Scales, cs	2	91
Iron statue	1	56
Mach'y, pkgs.	66	5,339
Tacks, cs	3	26
Cutlery, cs	22	471
Pins, case	1	45
Q'silver, flask	1	60
Mf. iron, pkgs	15	127
Iron, bars	15	49
Sew. ma., cs.	78	1,302

Venezuela

Clocks, case	1	9
Still	1	405
Scales, cs	3	39
Per. caps, cse.	1	186
Wh'ls & ax., pr	7	360
Ptlm., gals	17,510	1,805
Sew. ma., cs.	9	805
Hdw., pkgs	96	962
Mach'y, pkgs.	13	991
Mf. iron, pkgs	11	62
Cutlery, cs	4	152
Nails, kegs	21	77
Scales, cs	4	107

United States of Colombia.

Mf. iron, pkgs	515	5,090
Hdw., pkgs	244	4,464
Mach'y, pkgs.	305	5,046
Nails, kegs	116	332
Iron safes	3	993
Cartridges, cs.	66	1,333
Cars	2	1,811
Iron, pkgs	336	1,924
Track bolts, kg	125	1,190
Tin, pigs	5	150
Clocks, cs	11	293
Tin, cs	5	37
Lathe	1	275
Sew ma., cs.	132	2,754
Cutlery, cs	52	1,437
Ptlm., gals	7871	868
W. clos., pkgs	17	488
Ag. imp., pkgs	31	433
Revolvers, cs.	13	3,575
Pumps, pkgs.	13	617
Nails, cs	7	98
Scales, cs	39	269
Lead pipe, tub	1	86
Anchors	4	256
Anvils	25	293
Br. checks, case	1	37
Met. stamps, cs	5	919

Hayti.

Nails, pkgs	99	215
Chain and an.	1	22
Ptlm., gals	951	100

Argentine Republic.

Ptlm., gals	160,000	14,950
Hdw., pkgs	31	828
Machy, pkgs.	17	210
Ag. imp., pkgs	142	2,053

	Quan.	Val.
Scales, cs	66	1,396
Mf. iron, pkgs	6	279
Sew. ma., cs	115	3,050
Clocks, cs	58	2,800
Tacks, cs	50	575

Naples.

Hdw., pkgs	3	45

Central America.

Iron, pkgs	160	336
Cutlery, cs	14	542
Hdw., pkgs	36	661

	Quan.	Val.
Boilers	2	593
Nails, kegs	109	273
Ag. imp., pkgs	33	421
Cartridges, cse	1	24
Circular saw	1	150
Car wheels	60	290
Scales, cs	6	90
Sew. mach., cs.	47	848
Mf. iron, pkgs	763	3,050
Revolvers, cse	1	90
Ptlm., gals	87,299	9,351
Iron safe	1	88
Mach'y, pkgs.	2	150

Foreign Markets.

FRANCE.

PARIS, September 20, 1884.—*Metals.*—Business gradually improves. Metals have been more freely dealt in at irregular prices. *Copper* is lower, *Tin* better, *Lead* weaker and *Spelter* higher. We quote Copper, Chili Bars, 137.50 @ 140 francs ℔ 100 kg.; Ingots and Slabs, 146.25; Best Selected, 149.25, and Pure Corocoro Ore, 147.50; Tin, Banca, 229; Billiton, 221; Straits, 219; Australian, 220, and English, 212.50; Lead, 26.25 @ 27.25, and Spelter, 38 @ 39. *Iron.*—Things are getting to be decidedly duller in this city, where Merchant sells at 14.50, and Flooring Iron at 15. At St. Digier the market is featureless and irregular. At Valenciennes no improvement is noticeable; there have been, it is true, more orders, but not sufficient in the aggregate to favorably influence the market. On the contrary, if anything, it is weaker. The low prices at Paris have a depressing effect. Steel Rails continue very low; thus they are sold laid down in Algiers at 16.50 ℔ 100 kg. During the first eight months France has imported only 860,201 tons of Iron Ore, against 1,092,858 last year, and 939,918 in 1882; 145,049 tons of Pig Iron, against 219,448 in 1883; 50,704 tons of Finished, against 51,829; 9150 tons of Scrap Iron, against 18,026, and but 1023 tons of Steel, against 28,231. Re-export of Iron Ore, 76,248 tons, against 68,105 in 1883, and 73,707 in 1882. *Coal.*—The demand for Household use increases slowly; Industrial Coal is wanted to a moderate extent only, in view of the stagnation in the Iron trade. Prices are, nevertheless, tolerably well upheld.—*Moniteur des Intérets Materiels.*

BELGIUM.

BRUSSELS, September 30, 1884.—*Iron.*—Although the general position of the Iron market in Belgium is by no means satisfactory, special orders have dropped in, giving a lift to the generality of works, enabling them to bridge over an otherwise dull period. Following are the quotations: Merchant No. 1, 11.50 francs ℔ 100 kg.; Beams, 12; Corners, 12.50; Sheets, 15.50 @ 25.50; English Foundry Pig, 5.30; Luxembourg do., 5.30; Charlerol, 6.75; Puddling Pig, 4 @ 5; Luxembourg, 4.40; Steel Rails, 13.50; do. Hoops, 18, and do. Axles, 19. The orders alluded to above are for the most part small, yet they keep rolling mills going, and next month the Ruan Mills, at Monceau-sur-Sambre, will resume operations with a line of orders secured for months to come. Branch-line railroad building will also soon commence, so that the outlook is brightening. Large rolling-stock orders have been received for the Panama Railroad, independently of the cars for the same alluded to in our last, falling to the share of Cockerill and Willebroeck. Brais-le-Comte and Cockerill have received orders for both the Madrid and the Antwerp exhibition buildings. Steel Hoop and Axle orders for the Panama Railroad have been received by the Angleur Works. *Metals* have been irregular. We quote: Copper, 146.50 francs ℔ 100 kg.; Tin, 215 @ 220; Lead, 27; Spelter, 35.75, and Regulus of Antimony, 109. *Coal.*—The demand is for the moment, for Household Coal only, at 18 @ 22 francs ℔ ton.—*Moniteur Industriel.*

DORTMUND, September 30, 1884.—*Iron.*—The general aspect of Iron matters has been a calm one during the week. Business in Iron Ore has been stagnant, without leading to a further decline. There has been no improvement in Pig Iron; even if the demand for the same should increase, the capacity of production is so great that it would check a rising tendency. Rolling-mill products have, meanwhile, been moving off with tolerable steadiness; especially Merchant Iron meets with a ready sale, but at very low prices. As the building season approaches its termination the demand for Beams begins to slacken. Sheets move off well enough to prevent a giving way. There is no complaint on the score of Steel Rails; these remain active, with further adjudications impending. The International Steel Rail syndicate has been prolonged till 1886; in spite of underbidding by the French makers of Rails, no change has been deemed necessary in prices. There is a very good Hardware demand. Bridge-builders still complain of a lack of work; the few commands received are like a drop in a bucket, where there are so many in competition. Few orders are received for Locomotives and Cars. Machine shops, foundries and steam-boiler makers are throughout remuneratively engaged in Rhenish Westphalia. We quote Pig, 42 @ 44; Merchant, 110 @ 130; Rolled-Iron Wire, 120 @ 125; do. Steel, 120 @ 125, and Sheets, 153 @ 168 marks ℔ ton at the works.—*Cologne Gazette.*

HOLLAND.

ROTTERDAM, September 27, 1884.—*Tin.*—Some business has been transacted at yielding rates. We quote Billiton, 48.50 guilders ℔ 50 kg. on the spot; January delivery, 49. At Amsterdam a decline of ¼ @ ¾ guilder has taken place, Banca closing at 50; Billiton, spot, at 48.50, and distant afloats, 49.—*Koch & Vlierboom.*

AUSTRIA.

VIENNA, September 28, 1884.—*Iron.*—The fall trade ought to be in full swing by this time, but it is not this year, which is due to the difficulty which farmers encounter in trying to realize their products. Their disinclination to buy Hardware and Implements influences adversely the Iron trade. Finished Iron is dull and heavy; so far, Pig Iron is sustained, but prospects under this head are not encouraging. The new Rima-Muranz blast furnaces will soon both be blown in, and a decline in Pig will then be inevitable. The dullness of the season seems to depress Thin Sheets, and Tin Plates in particular, the latter having given way to a very low figure. While in Hungary machine-shops are doing very well, the contrary is the case in Austria proper. For the moment the Austrian Government will limit its orders for new Locomotives to 16, and for Cars to 200. Iron has been moving off steadily. Sheets only being neglected. We quote, Pig 51 @ 53; Merchant, 115 @ 134; Sheets, 170 @ 190, and Beams, 130 @ 135 florins ℔ ton. *Metals* have been steady; Copper, 72 @ 76; Tin, 108 @ 112; Antimony, 52; Lead, 16 @ 18.50; Spelter, 17 @ 19; Nickel, ℔ kg., 4.—*Austrian Trade Journal.*

BATAVIA, August 16, 1884.—*Tin.*—The next sale of Billiton Tin is to come off on the 29th inst. when about 10,000 pi

Trade Report.

General Hardware.

There is little to report concerning prices or business, there being few changes in quotations, and trade continuing of moderate volume. Manufacturers are, as a rule, pursuing a conservative policy in not forcing goods on the market by unduly increasing the discount, preferring to restrict their production, and hold rather than sacrifice their goods. Collections are reported good, most bills being paid promptly.

NAILS.

The demand is not so good as it was last week, orders having fallen off quite considerably in several directions. This may be only a lull in business, or it may be the beginning of a dull period of some duration. The active demand had continued for quite a long time, and there were hopes that it would not change for the worse quite so soon. Possibly the political excitement, which is very strong just now, may have interfered with the Nail trade, just as it is interfering with other branches of the Iron trade, and later on we may see a revival of activity, but at present the outlook is decidedly uncertain. The week has developed a tendency to purchase large quantities of Nails for speculation, but efforts in that direction, so far as we can learn, have not met with success, the agents generally refusing to make sales of Nails on speculative account for future delivery, and speculators almost always desiring to purchase for delivery three or four months hence. It is perhaps wise on the part of the manufacturers not to encourage business of this kind, as lots held in this irregular way are very apt to be put upon the market at a time when they seriously interfere with the course of regular business, and frequently demoralize prices. The sales made during the week have been at rates ranging from $2.10 to $2.20 from store in New York City, but carload lots have been sold by some parties at about 5 to 10 cents less, delivery on dock. These latter sales are exceptional in their nature, but at the same time have exerted their influence on store prices, which are not now so firm as they were a week ago, notwithstanding the fact that stocks in warehouses are in most cases exceedingly light, and standard sizes are notably in scant supply.

The La Belle Iron Works, of Wheeling, W. Va, as will be seen by reference to their advertisement on page 20 of this issue, have begun the manufacture of Steel Nails. Their works have been stopped since July 1, but resume this week. During the stoppage they have placed the engine and rolls on solid stone foundations, instead of the old wooden ones, and have put up two large regenerative gas heating furnaces, to be operated with gas manufactured on the premises. They thus get a soft, mild, regular heat for Steel, which will be much better than the harsh heat of a coal fire or the irregular heat of natural gas, where the supply is uncertain. With their improved appliances they hope to put on the market a first-class Steel Nail.

We are informed that the Bellaire Nail Works, of Bellaire, Ohio, have appointed Messrs. Durrie & McCarty, 97 Chambers street, New York, their sole Eastern agents, and have authorized them to sell at all times in accordance with best factory prices and terms.

BARB WIRE.

The fall trade in Barb Wire has proved very disappointing to all concerned. The prospects a month ago were exceedingly promising, the demand at that time presenting evidences of a possible increase in the future which justified rather rosy anticipations, but since then there has been a great falling off in the demand from all sections, and at present the trade seems to be at a standstill. The factories in this part of the country still have some orders on which they are working, but our advices from other sections state that works are being closed up for lack of business. Parties who had contracted to deliver Galvanized Wire to St. Louis, for instance, have had their orders countermanded, the purchasers stating that, having no demand for Fence Wire, there is no necessity for their receiving the Plain Wire. It is difficult to determine how long this stagnation will continue, as this is the time when orders naturally ought to be very abundant in the ordinary course of business. The outlook is gloomy for the winter trade. Prices may be quoted on the basis of 4¼ cents per pound for Painted Four-Point Wire, and 5¼ cents per pound for Galvanized. These figures are shaded for large quantities.

At a recent meeting of the manufacturers of

PICKS, MATTOCKS, ETC.,

it was unanimously agreed to make the following changes in their list of prices, said changes to date from October 15:

	Per doz.
Adze Eye, Long Cutter Mattocks, Light or No. 5	$15.00
Adze Eye, Short Cutter Mattocks, Light or No. 5	15.00

Also all Hunt Eye Picks and Mattocks to list the same as corresponding weights of Adze Eye goods.

MISCELLANEOUS PRICES.

At a meeting of the associated manufacturers of Coffee Mills, held in this city on the 9th inst., an advance was agreed upon, the discount to be 40 per cent. instead of 45 per cent., as heretofore.

The following are the discounts on the Patent Handle Wrought Bar Screw Wrenches sold by George B. Curtiss, No. 95 Chambers street, of which a description is given on page 33:

Agricultural Black	dis. 75
Mechanics' "	dis. 65
Engineers' "	dis. 60

By the advertisement of the Shaw Door Check and Spring Company, 164 High street, Boston, Mass., our readers will observe that they announce a reduction in the price of each Spring of $1 from their former list. Having removed to their new factory, and with their increased facilities for manufacturing, they are, we are informed, in good shape to receive and execute the orders of the trade.

ITEMS.

In the notice which we gave last week concerning Bates, Wilson & Co, *Thomas* Forsyth was erroneously named as representing them to the Western and Southwestern trade for the sale of the goods of the Snell Manufacturing Company. The name, as many of our readers understood, should have been printed *James* Forsyth, a gentleman who, from his long connection with the trade, is widely known, and at present one of the Flagler, Forsyth & Pierson Manufacturing Company.

J. B. Spencer, who is widely known from his long connection with Brown & Brothers, in a circular dated September 3 informs his friends that his business relations with them have terminated, and that he is no longer connected with that corporation. At the same time he solicits for them a continuance of the favors that have been bestowed on them in the past.

With reference to Skates the North Western Hardware Company, of Chicago, announce that they have in stock the Halifax Pattern Star Club Skates (Acme Pattern), of which they speak as equal to the Acme, and at a lower price.

In the same connection we may call the attention of our readers to the advertisement of Dame, Stoddard & Kendall, Boston, Mass., who, with their predecessors, have been agents for the Acme Skates for many years. It will be perceived that they announce that they are enabled to place these goods on the market this season at largely reduced prices, which they regard as low as those at which Skates of a much inferior order of quality and finish can be purchased.

An exchange gives a seasonable hint anent the coming winter. Winter brings with it the snow nuisance, and an invention is wanted to clear off the snow and ice from sidewalks and footways generally. A man who can devise a good and cheap machine for removing the snow and ice from the front of dwellings and stores will indeed be a public benefactor. Something is needed to supersede the broom and shovel, which are the universal tools employed for the purpose at the present time. All attempts which have been made at employing heat have been failures. What is needed is a good hand machine that can be manipulated, for example, in the same general manner as a carpet sweeper or lawn mower, and which can be readily used by any one. Something more than a mere brush or scraper would be required, but the machine need not necessarily be very complicated.

The annual fall expositions or industrial fairs are now in progress, and there is the usual series of excursion trains being run from the surrounding country to each of the cities in which these exhibitions are held. Milwaukee, Chicago, St. Louis, Louisville and Cincinnati, as well as some places of lesser importance in the West, are being visited in this way at the present time by thousands of retail merchants in various lines who otherwise might not see their nearest city at all. In some cases merchants and manufacturers, in order to encourage visits from the country customers, are sending out large numbers of special complimentary tickets, and in other cases special merchants' excursion trains are being run. It is always to the advantage of the dealer and manufacturer to come face to face with his customers, and it is likewise to his interest to have them visit his store and his works. It brings the two parties into pleasant and much closer relationship than can ever occur where business is transacted entirely by correspondence or through the instrumentality of traveling salesmen.

HORSE NAIL PATENTS.

We are informed that Judge Blodgett, in the United States Circuit Court, recently heard a motion on behalf of the Globe Nail Company, of Boston, to enjoin the Northwestern Horse Nail Company, of Chicago, from using the Chase process of finishing Horseshoe Nails, pending a suit which the former company has brought on the Chase patent, reissue No. 5207, dated December 31, 1872. A protracted litigation in the District of Massachusetts having resulted in establishing the validity of the patent, Judge Blodgett, after hearing both parties, gave the Chicago company, in view of the serious consequences which would flow from a summary stoppage of their works, a week in which to come to some agreement with the complainant. Unless such an agreement should be arrived at, it is reported that he said he would either grant the injunction or put defendant under bonds to pay such damages that might be found due on final accounting.

CATALOGUES.

B. F. Avery & Sons, of Louisville, Ky., have issued their illustrated catalogue and price list of Plows and Cultivating Implements for the season 1884 to 1885. In their circular addressed to their friends and customers in this their 59th season of manufacturing, they express their appreciation of the patronage bestowed upon them, and they hope that by care and attention in manufacturing they may receive the same substantial encouragement in future. They mention that they offer at this time many new and valuable Implements and that during the past spring they have added to their manufacturing facilities and buildings, so that they now have a capacity for turning out 2000 Plows a day, so that all orders can be filled the day they are received. The illustrations given on pages 4 and 5, representing B. F. Avery's first Plow factory, at Clarksville, Mechlenburg County, Va., and the present Plow factory of B. F. Avery & Sons, Louisville, Ky., is a striking evidence of their growth, as the simple log house is contrasted with the stately and extensive buildings now in use.

The catalogue issued by John P. Lovell's Sons, Boston, Mass., showing the line of Police Equipments which they manufacture, is at hand. In addition to the goods formerly offered, this catalogue shows a number of new articles, many of which are the inventions of Edward D. Bean, who has charge of their Police Goods department, and has had, also, they inform the trade, practical experience as a police officer, and is thus conversant with the needs of the service. Among the new articles are Patent Flexible Police Clubs, Improved Dark Lanterns, Patent Police Calls, Improved Chain Twisters and Handcuffs, Police Hooks and Leg Irons, all of which are of his invention. To some of these lines we may have occasion to allude again, and in the meantime we refer our readers to the catalogue.

THE ARRANGEMENT OF HARDWARE STORES.

As relating directly to this subject, we take pleasure in giving our readers the benefit of the views and suggestions which are contained in the following letter from S. H. Green, 15 Park Place, in this city, a manufacturer of wood boxes, who makes styles especially designed for use in Hardware stores. From the definite and practical nature of this communication we think it will be of some service to such of our readers as are interested in this question:

NEW YORK, October 14, 1884.

To the Editor of the Iron Age: I notice a discussion in *The Iron Age* in regard to shelving, &c., for Hardware. As I have had some dozen years' experience in retailing Hardware, and latterly the manufacture of small wood boxes, I will give my views, confining myself simply to the arrangements for holding boxes. It is, of course, necessary that each line of goods should be kept together. The various sizes will require different sizes of boxes to contain them. I do not think it a good plan to put divisions in boxes to accommodate two or more sizes of goods, as they are very apt to get mixed and the boxes are not so easily kept clean. For the proper display of goods a sample should be fastened on front of box, for this reason. Where articles are long they will require a wide box, not a deep one, necessarily. To meet above requirements my plan is as follows: All divisions above counter shelf to be one size, viz., 36 inches wide, 7 inches between shelves and 10½ inches front to back, width and hight especially to be full size. This size was selected by me some years ago, and has been adopted by many who consulted me previous to putting in their shelving. It seems to give satisfaction. To fit these shelves, all boxes, of course, would be 10½ inches long; in hight, two sizes, 3½ and 7 inches; in width, 3, 4½, 6, 9, 12 and 18 inches; all the latter divisors of 36 inches. This will allow 24 boxes (2 rows of 12) of the 3 x 3½ size in a division, or 16 of the 4½ x 3½ (2 rows of 8), or 8 boxes of 4½ x 7 (a single row), the other sizes working in the same way. By adopting this system, besides the advantage of being able to move the boxes around when new sizes or kinds are added, several of the above sizes can be put in one shelf and yet fill it completely, thus giving each article a box somewhere near the proper size to hold the package and allow sample to be placed in front. Green glazed paper is the best for fronts, as it will remain bright and fresh longer than paint, though I have seen stained fronts varnished that looked well. Under the counter shelf large drawers 18 inches wide by 20 to 24 inches deep and 8 inches high would hold most of the bulky articles. Yours truly, S. H. GREEN.

In the communication from "Knarf," which was printed in our last issue, the suggestion was intended to be that the shelves should be 12 or 15 inches high, having the boxes on the ledge and also on the two top rows twice as wide as others, for light and bulky goods. A different impression, and one inconsistent with our correspondent's plan, was given by the letter in the manner in which it was printed. But our correspondents thus far have left untouched many points concerning the general arrangement of Hardware stock and display of goods, in regard to which suggestion are in order, in reply to our subscribers' inquiries and for the general interest of our readers.

BARNEY & BERRY,

Springfield, Mass., have issued their catalogue of Ice and Roller Skates for the coming season. It is printed in their usual neat and attractive style, and represents their well-known line of goods, with several additions. Among these we may mention, in Roller Skates, their numbers O, J and M. No. O has frames and trucks similar to those on their P Skate, and is described as possessing the same advantages. The mode of fastening is of the keyless style, whereby no keys, heel plates or wrenches are required, both toe and heel clamps being simultaneously adjusted and secured by a thumb-screw at rear of heel. Every pair includes also their French Heel Attachment, and may be used as a lady's or gent's Skate, either with or without the attachment, which is for the purpose of making a secure fastening for French heels, as well as a support for weak ankles. The manufacturers speak of this Skate, from its scope of adjustment, compactness and durability of trucks, as especially adapted for renting in rinks. The list for this number is as follows:

No. 1, Blued	$4.00
No. 3, Polished and Nickeled	6.00
No. 4, Professional	15.00

Their No. J has the same mechanism for circling as the P Skate, together with the patented oil well, foot plates, heel plates and frames of metal, strongly riveted with steel brackets. The axles are described as of steel, ¼ inch diameter; black grain leather trimmings, patent buckles and nickeled heel bands. This Skate is secured to the shoe by a strap at the heel and clamps at the toe operated by a thumb screw at the heel, no key or heel plates being required. The list is as follows:

No. 1, Blued	$3.75
No. 3, Polished and Nickeled	5.75
No. 4, Professional	15.00

The M Skate is same as the one last described, except that instead of a clamp at toe a strap is substituted. It is especially recommended for renting in rinks. No. 1, Blued, is listed at $3.50. The manufacturers mention that their Roller Skates possess the same advantages as those of last year, important among which is their patented oil-well and steel springs, the latter having been improved lately both in pattern and manner of attaching. They also call attention to the fact that the position of the rear truck on this season's model of Roller Skates has been changed, being placed further back, thus obviating a difficulty which has been suggested by some of their patrons. Among the new Ice Skates are Nos. I, K, R and S. Nos. I and K are new lever-fastening. No. I has heel plates, foot plates, toe clamps and brackets made from crucible cast steel and blued. The plates are described as of fine finish, and the mode of fastening is the same as their keyless lever. This number is listed as follows:

No. 1, Blued	$2.75
No. 2, Nickeled	3.75

Their K Skate is described as made of the best material, the toe and heel clamps being simultaneously adjusted to any size by the action of a thumb-screw, and secured by a lever operated at back of heel. The list is as follows:

No. 1, Blued	$3.50
No. 2, Nickeled	4.50
No. 3, Polished and Nickeled	5.50
No. 5, Diamond Toe	6.50

Nos. R and S are keyless-fastening, and listed as follows:

R	No. 1, Blued	$2.75
	No. 2, Nickeled	3.75
S	No. 1, Blued	3.50
	No. 2, Nickeled	4.50
	No. 3, Polished and Nickeled	5.50
	No. 5, Diamond Toe	6.50

WILLIAMS & WHITE,

116 Chambers street, New York, have issued a circular of prices, among which are a number of changes on many lines of goods, most of them being reductions. The circular contains their revised list prices of Locks, many of which are very materially reduced, the discount, however, remaining unchanged. It will be perceived that the discounts on their miscellaneous goods are in many cases altered. Their discounts on their whole line are as follows, there being an additional 10 per cent. if bills are paid by the 15th of the following month:

Page in catalogue.	Dis. per cent.
1 to 37, Locks and Latches	40&7½
37 and 38, Door Knobs	40&7½
39 to 41, Escutcheons	40&7½
42, Nosings	40&7½
43, Brass and Iron Keys	40&7½
44, Bell Pulls	40&7½
45, Trip Gongs	40
45 and 46, Barton's Patent Gongs	33⅓
46, Alarm Door Bells	33⅓
46, House Bells	40&7½
47 and 48, Bell Cranks	40&7½
49, Slide Bell Pulls	40&7½
49, Check Springs	40&7½
50, Sliding Door Sheaves	40&7½
51 and 52, School House Sheaves with Oilers	50
52, Black Diamond Sheaves	50
53, Sliding Door Stops	40&7½
53, Sliding Door Rail, Cast Iron	40&7½
53, Sliding Door Rail, Wrought Brass; price per pound, not per foot	40&7½
53, Sliding Door Rail, Wrought Iron	50
54, Frame Pulleys	40&7½
55 and 56, Champion Noiseless Pulleys	40&7½
56, Axle Pulleys	40&7½
57 and 58, "Champion" Noiseless Pulleys, Brass and Bronze Face	40&7½

Change List.

Nos.	Per doz.	Nos.	Per doz.
600	$6.80	300	$5.50
601	11.00	301	6.80
602	13.00	302	9.00
700	5.50	1300	7.00
701	6 80	1301	8.30
702	9.00	1302	10.50
1600	8.30	400	6.80
1601	12.25	401	11.50
1602	14.50	402	13.00
1700	7.00	1400	8.30
1701	8.30	1401	12.50
1702	10.50	1402	14.50
200	6.80	500	5.50
201	11.00	501	6.80
202	13.00	502	9.00
1200	8.30	1500	7.00
1201	12.50	1501	8.30
1202	14.50	1502	10.50

Page in catalogue.	Dis. per cent.
59, Peerless Dumb Waiter Pulleys	50
60, Dumb Waiter Pulleys	50
60, "Champion" Dumb Waiter Pulleys	50&5
60, Yard Line Pulleys	50
61, Wrought Barn Door Pulls	Net

Change List.

Inches	⅝	¾
Per dozen	$5.00	5.50

61, Wrought Thumb Latches — Net

Change List.

Inches	⅝	¾
Per dozen	$11.11	13.33

62, Cast Spring Gate Latches — 40&7½
62, Wrought Spring Gate Latches — 40
62, Wrought Gate Latches — 60
Add Wrought Gate Latches on Plates — 60

Inches	9	10	12
Per dozen	$3.20	3.34	4.65

62, Round Gate Bolts — 20
63, Blind Fasts, Mackrell's Malleable — 60

Change List.

	Brick.	Wood.
Per dozen pair	$2.25	2.00

63, Blind Fasts, Mackrell's Brass — 30
63, Blind Fasts, Screw Pattern — 40&10

Change List $15 per gross.

63, Blind Fasts., M. and R., Old Pattern — 50
64, Blind Fasts., Van Sand's Pattern — Net

Change List No. 3705—$8.33 per gross.
Change " No. 3706— 8.89 " "

64, Wrought Turn Buckles — 60
64, Cast Turn Buckles — 60&5
64, Blind or Shutter Hooks — 50
65, Drops and Pins — 70
65, Wrought Drops and Pins — 60&5
65, Blind Springs — 50
65, Back Catches — 40&7½
65, Corner Irons — 60&10
66, Corner Plates — Net

Change List, 67¢ per dozen pairs.

66, Corner Knees — 40
66, Hold Fasts — 30
67, Bar Staples — 50&10
67, Swivel Bars — 50
67, Store Door Hasps — 70&7½
67, Batten Hasps — 50&10
68&69, Rolled and Welded Blind Hinges — Net
69, Rolled Plate Hinges — 75
70, Rolled Raised Hinges — 75
70, Welded Plate Hinges — 60
70, " Raised " — 50
70, Heavy Welded Plate Hinges — Net

Change list $7.22 per 100 pounds.

70, Heavy Welded Raised Hinges — Net

Change list $10 per 100 pounds.

71, Welded Hook Hinges — Net

Change List.

12 inches and smaller, $7.22 per 100 pounds.
14 inches and larger, 6.11 per 100 pounds.

71, Barn Door Hook and Eye Hinges — 50
71, Trap Door Hinges — 50
73, Flat Bolts — 40
74, Flush Bolts — 10
75, Flush Bolts — 40
76, Shutter Bolts — 50&10
76, Shutter Bars — 50
76, Floor Plates and Staples — 50&10
77, Staples — 75&10
78, Hooks and Staples — 75
79, Goose Neck Hooks and Staples — 75
79, Hooks on Plate Staples — 70
80 and 81, Hasps and Staples — 75&10

List of Hasps and Staples made of ¼-inch iron, heavier than our extra heavy. Discount same as regular Hasps and Staples.

Inches	6	7	8	9	10	11	12
Per dozen	$1.80	2.10	2.30	2.65	3.10	3.35	4.75

Hasps and Staples with Hooks, ¼-inch iron.

Inches	6	7	8	9	10	11	12
Per dozen	$2.95	3.40	4.20	4.95	6.45	7.75	9.30

82, Bent Hasps and Staples — 75&10
82, Trap Door Rings — 80
83, Trap Door Rings and Staples — 80
83, Hitching Hooks and Rings — 70&7½
83, Hitching Rings — 70&7½
83, Swivel Rings — 66⅔

Change List.

Per dozen, No. 4	$2.00
" No. 5	2.70

84, Awning Hooks — 75&10
84, Pipe Hooks — 70&7½
84, Leader Hooks — 80
85, Step-Ladder Hooks — 65
85, " Bolts — 65
85, Tinners' Hooks — 70&7½
85, Plumbers' " — 70&7½
85, Sign " — 66⅔
85, Looking-Glass Hooks — 50
85, Well " — 60&10
85, Cistern " — Net
86, S. " — 80
86, Open Links — 80&15
86, " Rings — 80&10
86, Wagon Body Staples — 70
87, Meat Hooks — 75
87, Extra Heavy Meat Hooks — 50
8, Rail Screws — 66⅔
88, " Braces — 50

Change List.

S. Pattern,	5 to 10 in.	$0.70 per doz.
	10 to 14 in.	1.00 "
Plate "	5 to 10 in.	1.30 "
	10 to 14 in.	1.75 "

89, Hinge Nails and Rivets — 75
89, Wagon Nails — 70
89, Iron Wedges — 40&7½
89, Heel Wedges — 50
90, Grappling Irons — 25
90, Nail Claws, 14 inch — 40&5
90, Nail Grips, 16 inch — 40&5
90, Ice Tongs — 75&10
91, Whitewash Brush Clamps — 55
91, Oyster Knives — 50
91, Oyster Blocks — 40&7½
91, Horse Weights — 10
91, Ox-Yoke Rings and Staples — 40&7½
92, Tweer Irons, Nos. 1 and 2 — 20&2
No. 3 — 33⅓
93, Dumb Bells — 30
93, Gate Balls — 20
93, Quoits — 30
93, Box Chisels — 55
93, Blacksmith's Pincers — 50
93, Blacksmith's Tongs — 55
93, Blacksmith Butterises — 70
94, Cold Chisels — 40

The following are their prices and descriptions of new Locks and Latches:

New Locks.

No. 017, same as No. 17, with brass turn thumb-piece.
No. 018, same as No. 18, with brass turn thumb-piece.

Barn Door Locks and Latches.

0133 — Latch only.
0134 — Lock, 1 Key.
0135 — " 2 Keys.

Heavy Reversible Rim, Jam Face, Sliding Door Lock and Latch combined, adapted for carriage-houses, barn doors, railroad depots and gateways. This Lock and Latch have this advantage—you can lock the Latch fast by putting the Key in upside down in key-hole of Lock, which makes it the most secure fastening for doors that run on rollers or hangers. The strike is made beveled, in case the door sways, so that the Latch will slide in. Small nickel-plated Keys are put up with the above.

134 A, same as 0134; 1 Brass Tumbler, 1 Key.
134 B, " 0134; 2 " " 1 "
134 C, " 0134; 3 " " 1 "
135 D, " 0135; 1 " " 2 Keys.
135 E, " 0135; 2 " " 2 "
135 F, " 0135; 3 " " 2 "

HARDWARE EXHIBITS AT THE LOUISVILLE EXPOSITION.

The display at Louisville this year is in some respects a disappointment. In many features, especially those in which our readers are particularly interested, the display is not up to last year's standard, the new undertaking at St. Louis on the one hand, and the great preparations in progress at New Orleans on the other, having made the Louisville exhibition more local than it was intended to be. The Hardware exhibits are comparatively few in number, and, though interesting, are not so displayed as to make them a feature of the exhibition.

Henry Disston & Sons, Philadelphia, have a large walnut and plate-glass case containing samples of their Saws, Files and Mechanics' Tools. The display is well arranged, and attracts much attention.

Thomas Meikle & Co., Lousville, make probably the most attractive display in their class. The base of their construction is round, inclosed by an annular trough of water. Inside this ring is a model farm in miniature, laid out on a knoll, around which is a railroad track with tunnels, trestles, telegraph wires, &c. Rising from the center of the farm is an octagonal column faced

with looking-glass for part of its light, and above this are black cloth panels in which are shown polished parts of Plows and Cultivators. Resting on the column is a large Plow bright with nickel and paint, surrounded by the trade-mark of Thomas Meikle & Co. Everything inside the annular trough is made to revolve, the concealed mechanism imparting motion to everything intended to move, including several steamboats of the Western river types, which follow each other around the trough. This exhibit attracts a great deal of attention, and is both ingenious and effective. The same firm also show a large collection of Plows, Cultivators and other Agricultural Machines.

The Yale & Towne Manufacturing Company, Stamford, Conn., show a complete post-office equipment in the exhibit of the United States Post Office Department.

The Southern Wire Works Company, Louisville, make a large display of Wire goods in all forms, chiefly Garden and Conservatory Fixtures and Office Railings.

The Kentucky Machine Company, Louisville, make a very extensive display of Machinery and Machinists' Supplies, including a case of Cleveland Twist Drills.

Kearney & Foot, Patterson, N. J., exhibit a case of Cut Files of English and American standards.

Mantle & Cowan, Louisville, show an extensive variety of Mill and Foundry Supplies, including a case of fine Leather-workers' Tools.

Geo. B. Bahr & Co., Louisville, make a large and attractive display of General Hardware.

E. C. Atkins & Co., Indianapolis, have a fine exhibit of large Saws, including nearly all varieties known to the trade.

The Eau Claire Chilled Plow Company, Eau Claire, Wis., show a variety of their Chilled Plows of excellent finish.

The Louisville Agricultural Company make a fine display of Excelsior Plows, Cultivators and other Implements.

McGill & Truman, Louisville, exhibit the South Bend Chilled Plows, Harrows, Planters, Cultivators and other Agricultural Implements.

Furst & Bradley, Indianapolis, exhibit a large variety of Plows, Cultivators, Horse Rakes, &c.

Brinley, Miles & Hardy Company, Louisville, make a creditable exhibit of Plows.

The Hoosier Drill Company, Richmond, Ind., exhibit Drills and Planters.

Gere, Truman, Platt & Co., Owego, N. Y, exhibit their Champion Drills and other Agricultural Implements.

Nicholson & Merrill, Louisville, exhibit a line of Plows and other Agricultural Implements.

Brennan & Co., Southwestern Agricultural Works, Louisville, exhibit a great variety of Agricultural and other Machinery, including a complete Sawmill plant.

The Pennsylvania Agricultural Works exhibit all kinds of Agricultural Implements and Farm Machinery.

Stratton & Terstegge, as agents, exhibit a large line of United States Stamping Company's Granite Ware.

In addition to the exhibits noted there are large, varied and interesting displays of Machinery of various kinds for Mowing and Harvesting and for economizing time and labor on farm and plantation. There is, however, a great scarcity of Builders' Hardware, Mechanics' Tools, House Furnishing Goods, Cutlery, and many of the class of goods which might, we think, be shown with advantage in the South. The East is very lightly represented, and, while it is undoubtedly true that there are a great many claims upon manufacturers who exhibit at all, a large and varied display in any one of the lines we have mentioned would be conspicuous at Louisville and carry off the honors.

From the *American Exchange and Review*, a journal devoted to insurance, we take the following article, which, besides being of interest to manufacturers as directly related to their business, contains information which entitles it to the attention of the trade at large. It is entitled

HARDWARE FACTORY FIRE RISKS.

So numerous are the articles composing hardware—screws, nails, spikes and tacks being always therein included, though generally made separately—that it will be needful to view this subject under some general classes. Even then, unless the principal objects made be specified, it will be difficult to obtain proper ideas of the several risks. Such division is the more requisite, since the United States census classifies differently from the technological distinctions. It is proper that wooden handles should be rated as a hardware risk, because when the making of them is combined with the making of other hardware articles it considerably influences the hazard. Commercially, such wooden-ware becomes hardware when joined to tools and implements. The classifications we here make in the endeavor to exhibit the hardware fire risks are as follows:

1. *Agricultural Hardware* (some malleable castings included).—Plow-shares, rakes, hoes, spades, shovels, hods, hay and manure forks, portable forges, post-hole diggers, fruit parers and cutters, bag holders, lawn mowers, hedge trimmers, grain and grass scythes, sausage and meat cutters and choppers, wedges and clamps, cast-iron farm bells, &c.

2. *Builders' Hardware* (largely malleable castings).—Locks, catches, latches, hinges (cast and wrought), knobs, hooks, knockers, bolts, bell pulls, cast spigots, scrapers, small pumps, brackets, gate and door wheels and ways, iron handles, turnbuckles, brackets, screws, tacks, nails, brads and spikes (the last five generally separate.)

3. *Cutlery and Other Tools.*—Knives, table knives and forks, axes, hatchets, adzes, sledges, mattocks, picks, hammers, squares, wrenches, small saws, plyers and cutters, chisels, gimlets, planes, awls, anvils, vises, small scales (spring and balance) shavers, trowels, augers, levers, nail drawers, shears and scissors, skates, smoothing irons, levels, punches, forceps, glue pots, geared borers, fluting rollers, files and drawing instruments (the last two generally separate.)

4. *Hollow-ware.*—Cast-iron pots, kettles and pans (often enamelled inside), brass and pewter vessels, cast-iron circular boiling pans, with and without furnaces.

5. *Saddlery Hardware.*—Comprising all the metal articles used for harness, and many of those for small parts of vehicles. Almost all the iron castings are of the malleable description, and there is large use of silver and nickel-plating on iron, &c., polishing and burnishing. Though sometimes combined with the making of other hardware, this division is usually separate.

6. *Wooden Handles.*—All of hard woods (except some for small shovels), and used for tools such as mentioned in Nos. 3 and 1.

Classification and data of the hardware industries in the United States census of 1880 are as follows:

Classification.	Establishments.	Capital.	Total employees.	Children under 15 (included).	Value of prod'n for 1880.
Cutlery and edge tools.	429	$9,859,885	10,519	681	$11,661,870
Files	179	1,666,550	2,508	268	2,486,533
Hardware	492	15,363,551	16,801	1,506	22,653,693
Saddlery hardware	64	1,655,550	2,815	337	3,651,021
Nails and spikes	62	3,877,805	2,910	380	5,629,240
Screws	20	4,265,000	1,585	264	2,184,532
Tools	145	4,384,109	3,151	80	4,236,568
Handles, wooden	206	1,032,000	1,375	71	1,656,698
Total	1,597	$42,104,450	41,864	3,577	$54,159,655

The last *Chronicle* fire tables show, for the nine years—1875 to 1883—one fire per annum for each 81 of the 556 hardware (and saddlery hardware) factories, or 62 fires in the period; one fire per annum in each 88 of the 429 cutlery and edge-tool works, or 44 fires in the period among 429 establishments, and one fire per annum in each 90 of the 179 file factories, or 18 fires during the nine years named. There were also, by the same reports, nine fires during the period (one per annum) among the 145 miscellaneous tool works, of which fires six occurred in 1883, and there were 27 fires in the nine years among the 206 wood-handle factories, or one per annum in each 67 establishments. Bolt, nut and screw works take fire at the rate of one in 36 per annum.

The tenth census shows that in 1880 there were in the State of Massachusetts (files and wooden handles not there given):

Classification.	Establishments.	Capital.	Total number of employees.	Value of production in 1880.
Cutlery and edge tools	63	$2,028,722	1,957	$2,133,654
Nails and spikes	86	2,336,055	2,926	3,126,275
Tools	49	614 527	505	629,709
Screws	9	163,000	446	253,590
Hardware (saddlery hardware not given separate)	24	668,850	568	737,400
Total	181	$5,811,154	6,402	$6,876,628

Among these Massachusetts establishments, according to State reports, there occurred only one fire (skate factory) during the seven years 1877-83 inclusive. The Massachusetts reports show 31 fires (losses $162,986) among hardware stores in the State during the period named.

The tenth census reports as existing in Philadelphia, in 1880:

Industries.	Establishments.	Capital.	Employees.	Value of production in 1880.
Cutlery and edge tools.	33	$1,120,222	858	$942,522
Tools (mostly the larger tools)	6	1,541,232	661	695,160
Hardware (saddlery hardware not named)	39	575,700	578	853,588
Files	12	229,450	339	318,513
Total	90	$3,466,724	2,436	$2,809,783

Very similar to the case with the Massachusetts State fire reports, there appear, by the fire patrol reports, to have been no fires among these establishments during the seven years 1877 to 1883 inclusive, except one fire in a tool factory in 1883—loss only $92. (See Review of March, 1884.) Such reported exemption from fires may have its explanation in peculiarities of classification.

1. Apparently, in agricultural hardware (a distinct risk from agricultural implements), the fire risk partakes in moderate degree of the jeopardy of the iron foundry and machine shop. There is considerable blacksmith work for shaping and tempering scythes, and making spades, rakes, hoes, hods and shovels. The five last-named implements are, however, often made in separate factories. When wooden handles are manufactured on the premises for the spades, rakes and hoes, there is added part of a wheelwright and turning fire risk, and there will be then some risk in wood storage. If the handles be purchased ready made, as is often the case, this part of the risk would be very much reduced. There is scarcely any other woodwork in this department, except patterns for foundry-work. Although they separately form a considerable interest, spade, shovel and hod works are not classified or returned in the United States census, nor are they mentioned in the Massachusetts fire reports or the Philadelphia Fire Patrol reports. They are doubtless, in the census, included in hardware What malleable castings are used in agricultural hardware works would generally be purchased from other parties. There is in this class a certain amount of danger from about 7 per cent. of very youthful help being required or used, but in this respect not quite equal to the next division of hardware.

2. *Builders' Hardware.*—This department, most important of all now under consideration, may properly be rated as the highest fire jeopardy of them all, it being composed of several separate elements of hazard. About 7 per cent. of nail, spike and tack works take fire per annum. The machine shop (numerous small shaping machines for specialties and numerous small lathes and planers) and foundry risk (with pattern-shop risk increased through smallness of objects) are here combined with the making of malleable castings, which form so large a portion of the stock that their purchase would be a disadvantage. Tempering ovens heated day and night are therefore requisite and there is a large amount of smithwork, needing many small forges urged by centrifugal fans. Much soldering is also necessary in these works, with its small heaters or furnaces and hot irons, whose danger we have previously described. The smallness of many of the objects made, and the strong competition existing, have caused the invention and use of a great number of machines for simplifying and increasing production—a fact which has its own fire-loss significance, although the machines themselves may be comparatively safe. To attend them, and for other reasons that could be named, many young children are brought into use—their proportion in the works being 9 per cent. of all of the employees. Some wooden handles are needed, generally made on the premises, which add a turner's fire risk, diminished somewhat by the wood used being mostly of hard descriptions.

The important industries—nails, spikes, brads and tacks—are considered an integral portion of general hardware, though usually performed in separate works. After the iron is drawn from the puddling furnace it is rolled into sheets in the usual mode, and these are cut while hot in slitting machines into strips of the width of three nails, such as are to be made. The modern nail machines cut the three tapering pieces, sever them and turn over the strip for the next cut. The pieces fall into a reciprocating hopper, whence they descend, through a slit wide enough only for one blank, to jaws which seize and hold it while a head is pressed at one end, and further on the proper point is given. There are cut nails now made almost equal in clinching power to wrought-iron nails—*i. e.*, hand-made nails, by means of annealing the strips just before cutting, either in the machine or otherwise. In general, the improved nail machines are not unlike the card wire-tooth machine, but very much larger, and not quite so complicated. Of course, their fire risk is increased when fires are added for annealing. There is an old style of hand-made wrought-iron nails still much used for certain parts of carpenter-work and for horse-shoeing, but they are much more expensive. It is worthy of note here that the fire risk of making cut nails is likely to be much altered by the introduction of steel as material. An extraordinary reduction is thereby made in the number of puddlers and laborers required, thus diminishing fire hazard; on the other hand, the risk is increased, in so far as the Bessemer process is more dangerous than puddling. The round nails so common in Europe, and formed from bright iron wire, are now made in a very few establishments in the Western States, but have not yet come much into use. Such works have a very low rate of fire risk, because the wire used is purchased, the dangerous puddling, tempering, or Bessemer-process heat is unknown there, and the nail-forming machine has less friction than the one for cut iron nails. The tack-making machine is like a diminutive nail-cutting machine, but in the large works where tacks, sprigs and brads are made, the number of these machines is great, and their own relatively low fire risk is thereby enhanced. There is a large quantity of oil used for lubrication of machines and tacks in process, and not a little danger from the making of the vast number of papers for packages into which the tacks are put for sale. Generally tacks are not made along with nails; and from the larger number of children employed, and other reasons named, the former works have more ignition risk than the latter. When tack factories burn the loss is generally heavy. One of the largest in New England was totally destroyed a few years ago, causing loss of about $200,000.

Screws, also an integral part of hardware, are generally made in establishments devoted entirely to their manufacture, and by machinery which receives the blanks from a hopper and forms the head, slitting it and making the helix by the use of steel dies, in a manner not unlike the simple plan of the screw-cutting lathe. There is now added a most ingenious automatic device which shapes the auger-like point of the screw. It may seem strange to assert that the form last named can influence fire risk, yet so it is. This invention, though so small, was mighty in the changes effected in work. The time saved by not needing holes bored, and by easier screwing home, has been actually enormous, and will always be so in comparison with the old blunt screw, and we think the axiom correct that whatever saves time, other things being equal, diminishes fire risk. Screw works, in being free from tempering furnaces—and sometimes also from puddling furnaces—though using a polishing process with oil, emery, &c., for finished work, are a less fire risk than nail works; in fact, not one-half the hazard. It is, however, probable that their risk will soon be much altered by the adoption of the Bessemer steel process, for reasons already mentioned.

3. The making of edge and other tools requires lathes, planers and many small shaping machines, as is also the case with building hardware, but the quantity of ordinary iron castings is much less, reducing the danger from melting the metal; the steel is generally purchased in the bar, while much brass is used, and in its working there is less friction and danger. Even in the casting of brass the jeopardy is not so great as in casting iron. While scarcely any malleable castings are used in tool works, thus not requiring the tempering ovens, there is more danger in the steel-tempering furnaces used for knives, edge tools, saws, shears and scissors, and the smithwork required is much larger in proportion than that for builders' hardware. Establishments for making files and for drawing instruments, both also separately manufactured, present the hardware factory risk at its minimum. Until a few years past, all files were cut by hand, but machines, in themselves of little danger, now perform the work with only the necessity of blanks being shaped beforehand by forging machines. Of course, the danger from forge fires still exists, but the forges are smaller and better confined than those of the blacksmith. For drawing instruments the demand is quite limited; the shops making them are therefore small, and, the work being mainly shaping and handfiling, the danger is slight. The making of these "instruments of precision" is more affiliated to watch-making than to foundries and machine shops.

4. The separate branch of hollow-ware using mostly cast iron, can have but little more fire risk than an ordinary foundry; it may properly be considered as less, because new patterns are rarely made, and one cause of fires in such works is largely diminished. As the making of copper and brass kettles, pans, &c., is often combined with iron hollow-ware, there is in such case added a moderate blacksmith risk in the forge fires required for shaping some vessels and for riveting. Where a portion of the vessels are enameled, the ovens used for that purpose would somewhat increase the hazard. Very little machinery and shafting are used for hollow-ware works, and the steam engines are generally small, except where the works, being extensive, require a number of large blast fans.

5. Saddlery hardware, in its fire risk, probably ranges immediately below building hardware. It exceeds that of cutlery and tools, because of fires kept up without intermission in furnaces of annealing ovens of malleable iron objects, which form the larger part of such production. The danger from defective heating flues is, therefore, a serious one in this industry. The number of planing machines and lathes used is not large, but the smithwork needed is very great in amount, though the forge fires are relatively small. The foundry risk is greater than in some departments of hardware-making, because of the smallness of all the patterns used, the frequency of renewal of such, and also the carrying of molten metal in ladles all over the foundry, instead of using traveling cranes and larger vessels, as is done for hollow-ware, &c. There is, in a separate part of the works, considerable japanning done, the ovens for which—in connection with the materials used—have a rather high fire risk. There is also much nickel and silver plating done, which adds the electroplating risk already considered. It is proper to state, however, that some manufacturers of saddlery hardware prefer to employ others to do this work, thus somewhat diminishing their fire danger. The number of young children here (11¾ per cent.) is greater than in any other department of hardware, except screws, where such persons amount to 16¾ per cent. of all employees. Such covering and working in leather as are done in these establishments cannot be said to add any appreciable fire danger Generally stated, the amount of machinery used is small.

6. The department of wooden handles seems almost out of place among the metal industries we have been considering, and yet it is so closely connected with three of them that it cannot be neglected. In many cases it is carried on in parts of the same buildings making general hardware articles, except hollow-ware and saddlery hardware, but sometimes proprietors are sufficiently regardful of their interests to relegate it to a detached building. As this wood risk endangers a much larger and more valuable stock in the hardware works than it does where carried on alone, it would seem to be true economy either to have for it works on a separate lot or to employ other parties to furnish the articles. Where adopted, it adds a carpenter and turning risk, besides that from the storage of lumber, often in very small pieces, and from such reason more inflammable. There is another wood risk which can scarcely be avoided in all hardware factories, except those for hollow-ware, in the numerous small wooden boxes required for transportation. If these were always made, along with wooden handles, in buildings separate and at a distance from main works, considerable fire risk would be avoided. A general survey of this extensive range of industries impresses us that they have not yet received the attention, as to data, which their importance deserves. Certainly this is so as to classification, and we believe it is also as to actual fires. A few years of attention and observation would correct this disadvantage.

Metal Market.

Copper.—Our market during the week under review has been excessively dull, with sales of Lake Superior not exceeding 100,000 lb at 13¢, while other brands command 12¢ @ 12½¢. Chili Bars have improved in London from £53. 15/ yesterday to £53. 17/6 to-day, Best Selected remaining steady at £59. According to Messrs. James Lewis & Son's, Liverpool, monthly Metal review of October 1, the deliveries of Copper during the first nine months of 1882, 1883 and 1884 in England and France were respectively 62,606, 68,103 and 83,068 tons Fine. Manufactures may be nominally quoted as under: Bottoms, 19¢; Braziers, 19¢; Sheathing, 17¢, and Bolt Copper, 19¢. We receive from London this afternoon the ensuing cablegram: "Market almost paralyzed during the week, but under a better feeling prices are firm. Best Selected, £59 @ £60, and Chili Bars, £53. 10/ @ £54. 5/."

Tin.—The London market continuing rapidly downward, a sort of panic having seized on the metal there, our own market has followed suit and is now down to 16¾¢, Straits Tin, while London from £73. 5/ yesterday gave way to £72. 15/ this morning. It seems that the chief London speculator for a rise has been liquidating for over a week past, and that thus a good deal of speculatively-held Tin has been thrown on the market in London and Holland. We receive the following from London per cable: "Market in a panicky state, and quotations difficult to give. Straits Ingot, spot, £73. 10/, and futures, £73. 10/ @ £74. *Tin Plates.*—There is a great dullness and a feeling that the market must go still lower, in consequence of the decline in Tin, which makes a difference of 6¢ ℔ box on Coke Tin, and of 10¢ on Charcoal. Some 5000 boxes Low B. V. grade Coke sold at $4.50. We quote large lines, ordinary brands, to-day as follows, at the close, ℔ box: Charcoal Bright, $5.05 @ $5.50; do. Ternes, $4.65 @ $4.85; Coke Tin, $4.65 @ $4.80, and do. Ternes, $4.37½. At Liverpool makers are pressing for orders and ready to make concessions, they quote per cable: Coke, 14/9 @ 15/3, and Charcoal, 16/ @ 18/6. From London we are told that the market is irregular.

Lead.—There sold during the week 400 tons Common Domestic at $3.70, and 100 tons Refined at the same figure. At the close $3.75 is asked and $3.65 offered for Common Domestic, while Refined is offered in vain at $3.70. St. Louis quotes both $3.55. Soft Spanish has remained unaltered in the London market during the week at £10. 15/. Manufactures are quoted as follows: Lead Pipe, 5¾¢ ℔ lb; Sheet Lead, 6¾¢; Tin-lined Lead Pipe, 15¢, and Block-Tin Pipe, 40¢, allowing in trade for Old Lead delivered in New York 3¢ ℔ lb. Shot: Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-lb bags, 1¢ ℔ lb extra. We are cabled from London that the market still remains quiet.

Spelter and Zinc.—The apathy in the Domestic Spelter market continues, last sales effected being at $4.45, and the market closing lifeless at $4.45 @ $4.50. London has remained steady at £14. 10/ for Silesian, which in this market is nominally worth $4.90 @ $5. We quote Bertha Refined, 8¢. *Sheet Zinc.*—Domestic has been moving off steadily at 5½¢. We are told from London per cable that Spelter is a little steadier, with Ordinary at shipping ports, £14. 10/ @ £14. 12/6.

Antimony.—Our market has been steady at 10½¢ @ 10¾¢ for Cookson and 10¼¢ for Hallett. The latter remains unaltered at £41 in the London market.

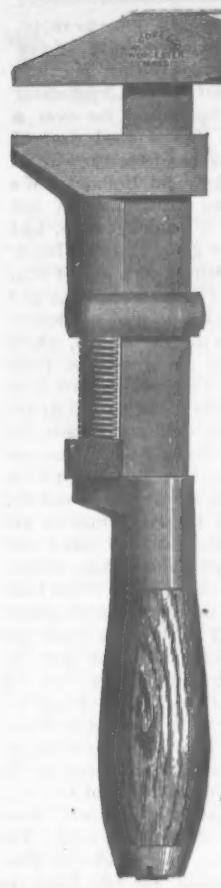
Coal.

We learn that official announcement will be made this week of a suspension of Coal production, and that the dates agreed upon will probably be the first week in November and the first and fourth weeks in December. In anticipation of this event, combined with cooler weather, prices have stiffened, but are substantially unchanged. Quotations are impracticable so long as circular prices are shaded to suit the views of individual dealers. Even the specials are sold a shade off in some cases now, as for some time past. The only approach to activity is in Stove Coal for domestic uses. Steam sizes, being in excess on account of the pressure of Bituminous Coal as well as the lessened demand for manufacturing, are broken smaller. As retailers generally have small stocks in their yards, a more active demand cannot be very remote.

Bituminous Coal is quiet at $3 @ $3.25 for Clearfield and $3.25 @ $3.50 for Cumberland.

The total amount of Anthracite mined thus far in the year 1884 is 21,331,451 tons, compared with 22,334,272 tons for the same period last year. The total amount of Bituminous sent to the Eastern markets thus far in the year 1884 is 4,139,274 tons, compared with 3,787,369 tons for the corresponding period last year.

State of the French Iron and Steel Trade.—The situation of affairs in the Nord, Loire and Haute-Marne, France, as reported to the *Ironmonger*, is becoming serious, owing to the paucity of orders, more especially in the heavy branches, both iron and steel. Merchants in Paris are cutting down prices, so much so that merchant iron has been selling at 155f. ($31,) and even below, and girders at less than 150f. ($30.) Several works in the Haute-Marne have been compelled to give notice of a reduction of wages. The crisis is also marked in the Loire, Rhône, and Andèche districts, where, out of a total of 26 blast furnaces, only 12 are in operation, and several of these are on the point of being blown out. The Terre-Noire and La Volte Works are fairly well occupied, but l'Horme has very few orders in hand, as may be judged from the fact that only one of its six blast furnaces at Le Pouzin is lighted. The Compagnie de Pont-Evêque is doing very little at the latter place, while its forge and blast furnaces at Givors are lying absolutely idle. M. La Rochette's works at the latter place are in a partially inactive condition, as out of three blast furnaces one is lighted, and even that irregularly. Firminy has but little to do. The Aciéries de St. Etienne and those of St. Chamond appear to be best off as regards regularity and importance of orders, but at Givors the last-named company have only one of their three blast furnaces at work. Their hands at Le Boncaut, however, are very well employed. The Aciéries de St. Etienne are executing a number of remunerative contracts, and so, in a minor degree, are the Usines Marrel, Jacob Holtzer et Cie, at Unieux; but we hear complaints of the existing depression from the works of MM. Claudinon, Arbel & Déflassieux, the Arms Factory, and the Ateliers de l'Etivalière.



L. COES'

Genuine and Mechanics,

PATENT

Screw Wrenches

MANUFACTURED BY

L. COES & CO.,

Worcester, Mass.

ESTABLISHED IN 1839.

Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped

L. COES & CO.,

Worcester, Mass.

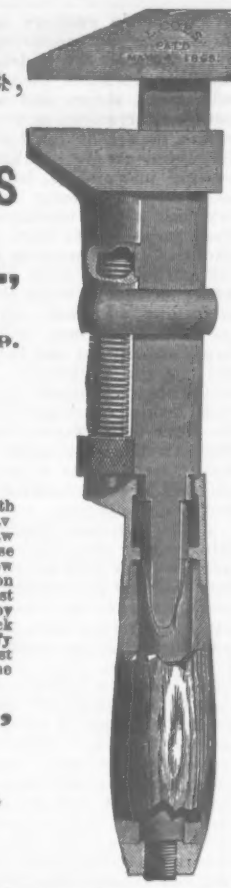
Warehouse,

97 Chambers and 81 Reade Sts.

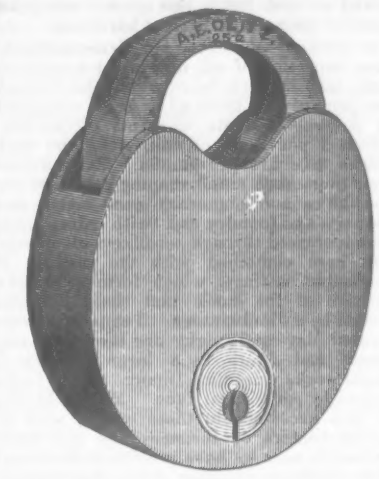
NEW YORK.

DURRIE & McCARTY,

Sole Agents



A. E. DEITZ.



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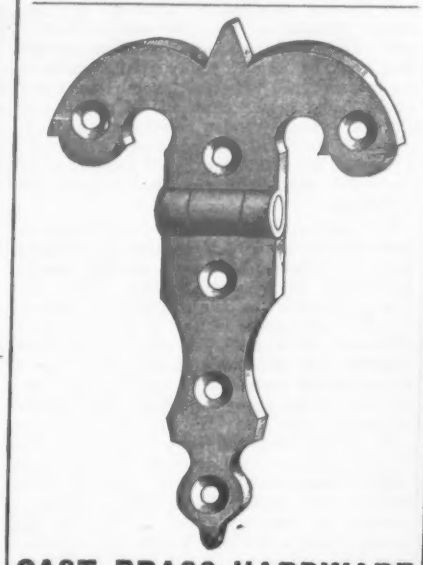
97 Chambers & 81 Reade Sts., New York.



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Coal Oil Torches

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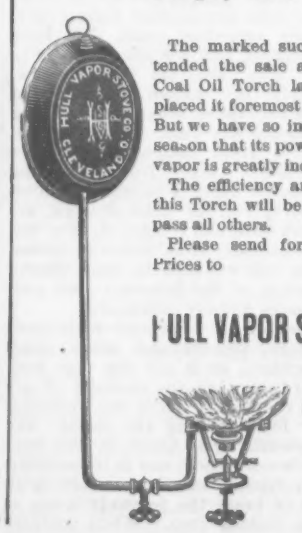
Foundries, Mills, Machine Shops, &c.



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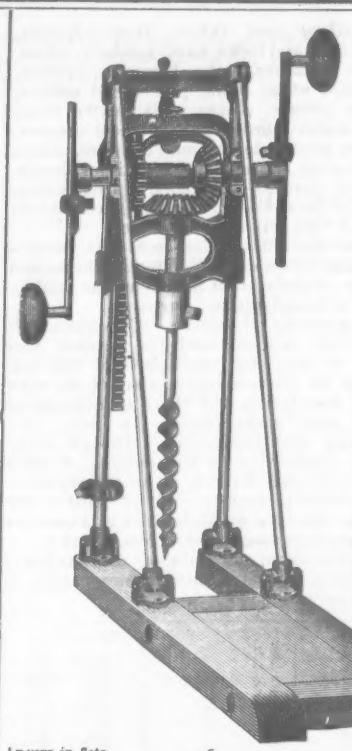

Millers Falls Boring Machine.

This machine has been fully perfected in all its parts, and is now sold with the full warrant that it will do better work and give better satisfaction than any other kind in use. The frame is made of half-inch round steel rods; the braces are the same and attach to the rods at the top by a set-screw. When this set-screw is loosened, the frame falls over so as to bore at any desired angle.

As seen in the cut, this machine has adjustable cranks, which fully regulate its speed and power. The rack and gears are all cut, which is not common in other machines.

We do not desire the reputation of making the cheapest goods in market, but we mean to deserve the name of making the best. We have never had good luck with poor tools.

PRICES:

Machines Without Augers,.....$7.50.

Augers in Sets.....18.....23.....41 quarters.

$3.00. $3.75. $6.75.

Sizes of Augers.....(1, 1½, 2.).....(1, 1⅓, 1½, 2.).....(½, ⅝, ¾, ⅞, 1, 1¼, 1½, 1¾, 2.)

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74 Chambers, Street, NEW YORK.

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Forged Horse Nails.

MANUFACTURED BY THE

NATIONAL HORSE NAIL CO.,

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HOT FORGED AND COLD HAMMERED POINTED MADE OF BEST NORWAY IRON AND WARRANTED.

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1884.

PENNSYLVANIA

LAWN MOWER.

Has no Equal Surassing all others, and pronounced

"THE BEST."

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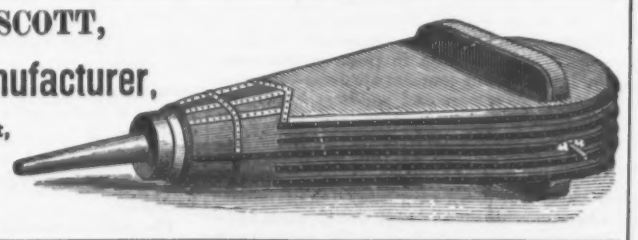

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TEA, COUNTER, UNION AND PLATFORM SCALES.

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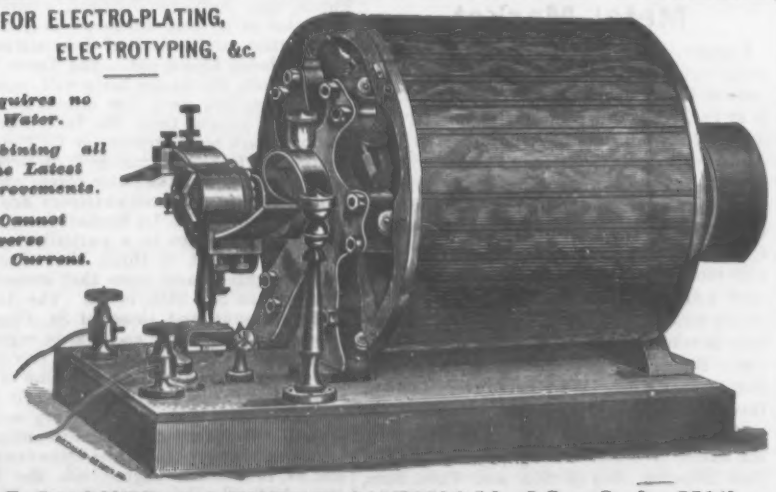

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Manufacturers and Importers of NICKEL PLATERS' SUPPLIES,

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First Award at Chicago Railway Exposition, 1883.

Patented Iron Planes, Cabinet Scrapers, Saw-Sets, Sewing Machine Stands,

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PULLEY CASTINGS,

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BOILER PLATES,

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ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our **C. H. No. 1 Boiler Plates,** which we manufacture expressly for the **Shells** of Steam Boilers and stamp **50,000 pounds T. S** when desired. **One hundred and sixteen tests** of this iron, made during the last three years by the **U. S. Inspectors of Steam Vessels,** show an **average tensile strength** of **58,808 pounds** to the sectional square inch, and an **average reduction of area** of the fractured section of **30½ per centum.** Our prices are as low as the production of a good article will admit of.

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PURE TURKISH EMERY.

WALPOLE EMERY MILLS,

South Walpole, Mass.

English Letter.

(From Our Regular Correspondent.)

LONDON, September 29, 1884.

THE WEEK

has not been a very eventful period from a commercial or trade point of view, yet it seems tolerably safe to state that the tentative improvement of which I spoke in somewhat guarded terms last week has been maintained. There appears to be an almost general conviction that the bottom has been reached and that prices are now likely to mend rather than retrograde; indeed, there is abundant evidence to show that in most branches any further retrogression is practically impossible. The existence of this belief, therefore, is already showing hopeful results, seeing that some grades of pig iron, sheet iron, galvanized iron and certain other articles are higher by appreciable amounts than they were a fortnight ago. The improvement is not due, so far as I have been able to ascertain, to any spurt in buying (except in the home market), but is the outcome of cold-blooded calculations, and to some extent the survival of the fittest. The process of crowding out has been going on quietly for some time past, and has at length produced an aggregate which has some weight upon the course of business. It says something for the stability of our remaining concerns that the depletion has been accomplished with so few failures and with so slight a disturbance of business. This absence of stoppages is no doubt largely attributable to the remarkable and long-continued cheapness of money, which has enabled many a weak concern to keep on its legs and at length to expire quietly that must otherwise have struggled most violently. The paucity of bankruptcies in the iron and metal trades may also be partially owing to the stringency of our present Bankruptcy act, under which private arrangements are far more numerous than formerly. Whatever the cause, however, the result is satisfactory in the main, and we shall have sound reasons for congratulating ourselves if we manage to pass into a state of renewed prosperity without having to undergo the panics and irregularities which generally accompany the epoch of minimum values. It is a little noteworthy, perhaps, that up to the present time of writing the metal market proper has manifested no signs of any change for the better, excepting in the cases of spelter and quicksilver, which are not such food for the gamblers as are tin and copper. These last-named metals are very sluggish, and there is some curiosity as to what may be the next moves of the persons who are popularly supposed to control tin "from Penang to Peru"—that is to say, from the mines to the ultimate purchasers. Meantime, consumption is on a fair, but not heavy, scale.

THE INSTITUTE MEETING

last week, at Chester, proved one of the most animated, as well as one of the most enjoyable, in the annals of such gatherings. The attendance was very large and the proceedings were in many respects much superior to those of the past year or two. As I took the liberty of foreshadowing last week, the paper of the meeting was that of Mr. Seebohm, on the manufacture of crucible steel, although other kinds of steel and the best methods of producing or manipulating them also received a great deal of attention. I need not attempt to follow the literature of the meeting here, inasmuch as you will no doubt receive the very full and faithful report of your London contemporary, the *Iron monger*, but I may be permitted to remark that Mr. Seebohm's paper has somewhat excited the ire of Sir Henry Bessemer. Sir Henry was unable to attend the meeting, owing to his state of health, but he has written a letter from Hastings, where he is staying, in defense of his own material. He hits the crucible-steel men "where they feel it" when he dwells upon the enormous quantities of Bessemer scrap, rail crops, &c., melted down and sold as crucible steel, and he absolutely scalps them when he prophecies that crucible-steel will be virtually extinct a few years hence. I may be wrong, but I fancy we shall have a very interesting, albeit stormy, series of discourses from these texts.

THE FAIR TRADERS

boast that they are constantly gaining ground at Sheffield and other large manufacturing centers, and hint that at no distant date they will put forth their strength in a manner which will command the respectful attention of both the great political parties. This eventually may be safely left to time, but I am bound to state that there is in all directions a very marked dissatisfaction with the actual outcome of the application of the doctrines of the original free traders. Very few intelligent men doubt the soundness of free-trade theories, just as all men must believe in the benefits of religion or of universal peace, yet there are few who hold that free trade is making advances outside this country. That being so, the fair traders urge we must be in the wrong, and they clamor for an early and thorough inquiry into our existing fiscal system and commercial treaties. Sound free traders are being horrified by teachings such as that embodied in the following excerpt from a journal entitled *Fairplay:*

"Nothing is more certain than that this country will return to protection. The assertion may appear hazardous, but no one who has watched carefully the working of the public mind—not the public writers' mind—can entertain any doubt on the matter. The change, when it comes, may be for good or for evil; that will depend upon how it is brought about, and how far it is pushed. Englishmen have such an incurable habit of rushing to extremes that changes, when they do come, are apt to be carried too far. What has rendered this particular change inevitable is the admitted failure of the predictions of the band of able men who, on the strength of those predictions, in which they themselves firmly believed, swept away protection to native industry, when, if they could have read the future more correctly, they would have been content, perhaps, to modify it. No one can deny that the country has prospered under free trade, but no one can deny that other countries have prospered in an equal or greater degree under protection. Therefore, that argument goes for nothing. It has to be shown that we should have prospered less under any other system, or that our rivals would have prospered as much as they have if our markets had not been thrown open to them. As neither of these propositions admits of proof, it would be waste of time to dilate upon them. It will be more profitable to reason on things as we find them, and what we find is that, with the loaf cheaper than ever it was, our foreign trade is declining, while our home trade is in such a state that none but pensioners, fund-holders, annuitants and the classes generally which neither toil nor spin nor produce anything, but live on fixed incomes, which in some cases they do not earn, are in any respect the gainers by the much-desiderated cheap loaf. Why is this? No one can deny the truth of what we say. The custom-house returns prove it. The observation of any business man who passes from one to another of our great manufacturing centers will bear it out. With one or two exceptions, trade everywhere is bad; workmen are out of employment; masters are compelled to reduce wages, and where further reductions in that direction are impossible are compelled to take steps to get rents and royalties reduced. The struggle with every one engaged in trade is to make both ends meet. Savings of more prosperous times are drawn upon; and, like the dormouse, many of our greatest producers are hibernating on their own fat and their stored nuts. Hibernating! If it were only a question of supporting the present for a time on the accumulations of the past, the evil might be borne with patience; but our store of nuts is being exhausted, and our dormice are beginning to feel doubtful as to the source from which a future supply is to be derived. In that doubt there is danger. No danger to the State, but danger to the theorists, who have seen a hundred things happen of which they have never dreamed, but who have not seen a single one of their predictions verified. Are we to go on trusting these men forever? If something greater than steam, more powerful than electricity, should burst on the world and give production the fillip which it once more requires, confidence in our philosophers would no doubt be restored, for it is not the gainer by brisk trade who reasons much, or whose reasoning is to be accepted without question; but, in the absence of such a fillip, will workingmen—and it is they who control Governments—will they rest contented with the present state of affairs? We doubt it. The cheap loaf is a fine thing, but cheap and dear are relative terms, and to a man whose pockets are empty, whose labor can command no market, it matters little whether the loaf be sold at sixpence or a shilling. He has neither the sixpence nor the shilling to spend, and the price of bread, compared with his means, is a fancy value for which he cannot find an adequate symbol in coin. It is, as we have said, in this direction that the danger lies, and our national safety may depend upon the prompt recognition of the fact.

THE IRON MARKET

appears to have gained a little in point of tone during the past week or ten days. It is not very clear why or how this tentative improvement has been effected; still there seems to be no doubt of its existence, and of the general impression that we have at last passed the worst of the long period of depression. At Glasgow the warrant market opened more quietly, and quotations have since been rather weaker, closing at 41/8 ₱ ton. Shipments are fairly good, and Connal's stocks are gradually becoming smaller. Makers' brands of Scotch pig are again rather dearer by 6d. to /1 ₱ ton, and are supported by the rumor that a further number of furnaces is likely to be stopped by some of the ironmasters. Whether or not this rumor has any foundation remains to be proven, but it is certain that some of the producers declare themselves to be so overweighted by royalties and other charges that they cannot make living profits at current selling quotations. At Middleboro' the market for crude iron has gained a little, owing to the respectable shipments and the higher values in Scotland, but the alteration is not fully established as yet, and No. 3 has still to be quoted at something below rather than above 36/9 on the average. In respect of hematite pigs there is virtually nothing to record, mixed lots of Nos. 1, 2 and 3 being averaged at 43/ @ 44 ₱ ton. The dullness of the rail mills affects this class of pig iron considerably, and at the moment prospects do not favor the idea of an advance in selling prices. In Staffordshire, Lancashire, Derbyshire and the other smelting districts matters remain quiet, and late quotations are nominally sustained, although it is very well known that good buyers have no difficulty whatever in shading the open market quotations. As regards heavy manufactured iron, affairs are largely unchanged, the demand for shipbuilding iron being still much contracted. For armor there is a steady call, and a tolerably satisfactory turnover is being achieved by the producers of boiler-plates, dockyard iron, special rolled sections and cable iron. Fencing wire and galvanized iron are in better request, orders for the latter having been placed at 5/ @ 7/6 ₱ ton more money last week. Besides these, there are numerous, albeit cautious, inquiries about for galvanized sheets, especially in London, and considerable lots are believed to have been arranged for, in a quiet way, within the past 10 days or so. In ordinary finished iron the features of the week have been entirely prosaic. Marked bars remain at £7. 10/, with second qualities at £7; good unmarked bars at £6. 5/ @ £6. 10/; medium at £5. 15/ @ £6. 2/6, and common at all sorts of figures down to £5, or even £4. 17/6 for ordinary Welsh in India assortments. Sheets are steadier at £7. 12/6 for doubles and about £8. 12/6 for lattens, and are in good request for stamping, tin plate, &c., purposes. For old materials of all kinds the demand is only indifferent, the United States being relatively small buyers of old rails and wrought scrap. Freights are somewhat irregular, but for the most part easy. Pig iron, by ordinary steamers from Glasgow to New York, is called 2/6 @ 3/ ₱ ton. Steel is in moderately steady request, but at Sheffield there is no pressure for crucible cast sorts, and some of the houses in that line are reported short of orders. The concerns devoted to steel castings and forgings are well engaged, as also are the older manufacturers of best tool steels. The Bessemer concerns are doing moderately well in billets and rolled sorts, the scarcity of crop ends having been of assistance to some of them in other departments. Mild steel, as produced by the Thomas-Gilchrist and Siemens processes, is in good request for a variety of purposes. Steel rails are wholly unchanged on the late basis, with the exception as regards 500-ton lots mentioned last week. The meeting at Bonn reaffirmed the agreement in a general way, subject only to a slight revision of details, which are of no special interest to ordinary buyers of rails. The quotation for usual heavy sections is £4. 15/ ₱ ton at the works, as heretofore. Few new orders of any note are being placed. Tin plates are for the most part steady at about late rates, although here and there offers are being made at 14/9 for ordinary I. C. cokes. Steel plates sell well, but ternes remain very quiet for the season.

SCOTCH PIG IRON

was rather quieter at the beginning of last week as regards warrants, but there was a little better feeling toward the close, and a fair number of transactions were recorded. The cheapness of money (the bank rate being 2 per cent. only, since June 19) favors all the speculators, which makes them eager to take advantage of all possible openings. Scotch makers' brands are again firmer to the extent of 1/ or so ₱ ton, the advance being most pronounced as regards Langloan and Coltness. Shipments still compare badly with those of the same period of 1883, and the total to date is 68,442 tons in arrears. Middlesboro' imports into Scotland are now increasing, owing to the wider margin between the prices, and are only 5507 tons behind those of last year to the same date. There are now 94 furnaces in blast in Scotland, against 114 a year ago. Connal's stocks decreased by 480 tons last week, and now stand at 583,757 tons, as compared with 587,852 tons a year back.

MIDDLESBORO' PIG IRON

is a shade firmer, in sympathy with the Glasgow market and by reason of the good shipments now taking place. For G.M.B., f.o.b. at makers' wharves in the Tees, net cash, less 2½, on 10th of following month, the current rates are:

No. 1 Foundry	39/9	Mottled	35/9
No. 2 "	38/3	White	35/6
No. 3 "	36/9	Refined Metal	52/6
No. 4 "	34/9	Kentledge	39/
No. 4 Forge	34/3	Cinder	33/6

INDUSTRIAL ITEMS.

MASSACHUSETTS.

The Lowell Machine Shop, Lowell, has recently received orders from the Sibley Manufacturing Company, of Augusta, Ga., for $100,000 worth of new machinery.

NEW YORK.

Otis Bros. & Co., 92 and 94 Liberty street, report that they have just closed a contract with the Youghiogheny Coal Company, of Pittsburgh, for one of their 10 x 10 "New Otis" hoists This engine is to operate at their coal bank for their tipple. They also have closed a contract with the Glamorgan Iron Company for a hoisting engine for the furnace now undergoing alterations.

Notwithstanding the dullness of trade in general, Frank H. Clement, of Rochester, states that orders for his wood-working machinery have been considerably larger during the first seven months of the present year than in any similar period since he has been in business. This is substantial testimony to the merit and cheapness of his machinery.

NEW JERSEY.

One report, for which we can find no authority, is that the Delaware Rolling Mill was purchased in the interest of the syndicate who are now experimenting with the Henderson process of making steel, and that future tests will be made in Phillipsburg.—*Easton Free Press.*

PENNSYLVANIA.

Holgate Bros. will, in a few weeks, occupy a portion of the Erie Railroad Company's old shops at Kane, as a brush-handle manufactory. They have recently purchased a 2000-acre tract of hardwood timber in the vicinity of Williamsport, all of which is to be made up into brush handles of various shapes. Rowley & Hermance, of Williamsport, are constructing for this firm 15 machines of novel design, which will receive the boards and convert them into handles for brushes of all kinds.

Cruikshank, Moyer & Co., of Danville, have just finished a large engine for the Lewisburg (Pa.) Nail Company, and 18 heavy nail machines for the Danville Nail Works.

The wages of the puddlers at the rolling mill at the Hollidaysburg Iron and Nail Company have been reduced from $4 to $3.50 per ton, and the wages of the laborers have also been reduced.

Riehlé Brothers, of Philadelphia, state that the business outlook is brighter with them, orders coming in more freely for their scales and testing machines. Among their recent orders for the latter may be mentioned a multiple wire-testing, straightening and stretching machine for the Trenton Iron Company, cement tester for the United States Government, at Washington, D. C., one of the same type for the Fort Dodge Gypsum Stucco Company, and an improved foundry tester for Steel & Condict, of Jersey City. The firm of Riehlé Brothers enjoy the honor of having their chain tester, which they built for Bradlee & Co., tested and approved by the British Lloyds, and it is believed that this is the only machine so approved. All the machines built by this firm are guaranteed to stand the same test that this machine was subjected to.

The National Tool Company, of Williamsport, make a specialty of fast-working iron planers. Of the large number of these machines in use, none have failed to give perfect satisfaction. They are said to be the most rapid workers for their size in the market.

The puddling and band-iron departments of the West Hamburg Rolling Mill commenced work on double turn on October 6, affording employment to a large number of workingmen. Nevegold, Scheide & Co., of Bristol, are operating the works.

Lapweld Furnace No. 4 of the Reading Iron Works has been started up, employing 25 hands.

A sale is announced to take place Thursday, October 23, on the Coatesville Iron Company's premises, of the personal property, consisting of blooms, horses and carriages, &c., to pay the county taxes on the property and also to pay the large number of ironworkers employed in the mill at the time of assignment. This will be good news to many of them, who have been looking forward anxiously to some such move on the part of the managers of the assigned estate.

The wages of all slate operatives in Lehigh and Northampton counties whose employers are members of the Slate Exchange have been reduced 10 per cent. This action was decided on by the exchange at its meeting in Easton, but was kept a secret until the announcement on Monday, October 6.

The Keystone Coal and Coke Company, at Roy, Butler County, have closed a contract for the erection of a coal crusher and washer, with a capacity of 250 coke ovens, to be completed by the first of November. They have a large force of men building the ovens.

Raney & Berger, of New Castle, were to have blown in their furnace last Monday.

The Chartiers Block Coal Company have decided to increase their indebtedness $100,000, the proceeds to be used in further developing their coal in Fayette County.

The employees of the Dunbar Furnace Company did not accept the 10 per cent reduction tendered them, and the president of the company has reconsidered his threat to shut down the works. Business is going on there as usual.

The partners in the new steel nail works to be erected at Pottstown have applied for a charter, under the name, style and title of the Ellis & Lessig Steel and Iron Company, Limited. The names of the partners in the concern given in the application are William S. Ellis, George B. Lessig, J. B. Lessig, Jr., and Thos. Searles.

Monocacy Furnace, below Reading, was sold at sheriff's sale, Saturday, to George F. Baer, representing the Philadelphia and Reading Coal and Iron Company, for $1900, subject to a mortgage of $105,000.

Messrs. Francis & Co. have just completed and put in operation a forge, containing six fires and one hammer, at Spring City, Chester County, for the production from scrap iron of blooms for the manufacture of plate and sheet iron.

PITTSBURGH AND VICINITY.

Dilworth, Porter & Co. have withdrawn the 10 per cent. reduction in wages which was announced some time ago, and the men will go to work at the old rates.

Oliver Brothers & Phillips have rescinded the order for a reduction in wages, and the old wages will be paid. They have, however, started up only a portion of their works, and it seems probable that they will not be able to run as steadily as they would have done had they been able to adjust wages as they desired.

A peculiar accident occurred at the mill of J. Painter & Sons last week. The damper on one of the furnace stacks of the mill broke and dropped down over the top of the stack, causing the gas to burst out through the holes in the furnace and burn several of the workmen slightly about the face and head. The lever which was attached to the damper fell through the roof and narrowly missed striking a boy on the head. On account of the accident the 8-inch mill was compelled to shut down for a short time.

The Solar Iron Works, of Wm. Clark & Co, have received an order for 150,000 cotton ties.

A large portion of the roof of the mill of the Pittsburgh Forge and Iron Company, at Verner Station, Allegheny, was blown off during the storm on the afternoon of October 8. The accident will necessitate a temporary shut-down.

Thomas Evans & Co., of the South Side, have fitted up the old Mulvaney glass works, at the foot of South Seventeenth street, and will manufacture jars and chimneys there. They will start up this week with a force of 80 hands.

A great many of the Italians and Hungarians who are employed in the coke regions are leaving for home. Large numbers pass through Pittsburgh daily.

The Westinghouse Air Brake Works, it is stated, will be shut down for repairs this week. The employees fear that a prolonged stoppage is contemplated by the company. A short time ago a large number of hands were discharged, and latterly the works have only been running little over half-time. Orders are reported very scarce.

The H. C. Frick Coke Company have for some time been lighting portions of their mines by electricity. They have now four lamps in use.

Rumors are in the air regarding trouble in the Coke Producers' Association. The members of the producers' wing of this organization are said to claim that the syndicate are not asking a sufficiently high price for the coke which is handled.

D. W. C. Carroll & Co., boiler-makers, have ordered a 10 per cent. reduction, going into effect on Monday, October 13. The reduction affects only the skilled workmen, the common laborers, those making but $1.25 per day, being excluded. A member of the firm said in an interview that they had been paying a little more for skilled labor than any of their competitors, and that it was simply a matter of necessity.

OHIO.

W. N. McGugin, the receiver of the bankrupt Union Iron Company, of Portsmouth, announces that the property of the company will be offered for sale on November 11. The real estate consists of the Jackson Furnace property, the Washington Furnace property and the Monroe Furnace property. The first consists of 5000 acres with improvements, and is appraised at $19,500; the second consists of 5200 acres, valued at $44,500, and the third of 8600 acres, valued at $49,000.

MICHIGAN.

The Fulton Iron and Engine Works, of Detroit, announce that Isaac De Graff has assumed control of the mechanical department of their works, and is also assistant manager of the establishment. Mr. De Graff is well known as a competent and skillful mechanical engineer.

The Vulcan Furnace Company, of Newberry, has just put in an electric-light plant sufficiently large to maintain 100 Edison incandescent lights, enough to illuminate the furnace, saw mill, retorts and barns, each light being equivalent to 16 candles. The plant was put in by Walter C. Livermore, of New York, and S. W. Glover, of Detroit. The retorts are doing better than ever before, but lack considerable of having arrived at the paying point. The furnace is turning out 60 tons of iron each day, which is good work.—*Marquette Mining Journal.*

ILLINOIS.

Press telegrams report that an explosion of some kind took place at one of the blast furnaces of the Joliet Steel Company, on October 11, setting fire to the stock-house, which, with several cars and other property, was entirely consumed. We are not advised as to what extent the furnace was damaged.

Thomas C. Massey, manufacturer of what are known as the E & K parallel instantaneous-grip vises, has recently removed from Batavia to Chicago.

Dr. Clinton Ogden, who succeeded the firm of E. Robertson & Co., at Joliet, manufacturers of brass and iron castings, is enlarging the works and will double their capacity. The addition which is now being built is 24 x 36 feet in size and two stories high. A machine shop has also been added. The works are expected to be in operation in 10 days.

An order for a 600-horse-power Berryman heater for the Kansas City Cable Railway has just been placed with the Chicago house of J. B. Davis & Son.

The Chicago Forge and Bolt Company, at South Chicago, and the city plant, the Shumway & Burgess Bolt Company, are busy in getting out the ironwork for their contracts with the Government for harbor improvements at Chicago and several points on Lake Michigan.

The Prindle Manufacturing Company, of Aurora, with a capital stock of $12,000, have just been incorporated. They will manufacture door hangers, window fasteners, carpet sweepers, &c., and will begin operations January 1.

The Secretary of State has issued a license to incorporate the Passenger Car and Rolling Stock Company, of Chicago, with a capital stock of $500,000, to build railway cars.

The Knowlton Manufacturing Company, of Rockford, recently shipped one of their large slow-rising, quick-striking helve hammers to the Cambria Iron Works, of Johnstown, Pa.

Fred. Crich and Hugh Dempsey have entered into partnership to do a general galvanizing business at Joliet. Their works are now being fitted up, and are of brick, 60 x 30 feet in size and two stories in hight. The capacity will be about 6 tons a day.

The Crane Bros. Manufacturing Company, of Chicago, are building one of their standard hoisting engines for Wm. M. Kauffman's Sheridan Furnace, Pa., for use at No. 2 Stack, and will soon have in operation one of their large size hoists at the Iron Mountain Company's Blast Furnace, at Durango, Mexico.

WISCONSIN.

The North Chicago Rolling Mill Company, at their works in Milwaukee, are making nails which have stamped on one side the names of "Blaine" and "Logan," and on the reverse side "N. C. R M Co.," and on the head the letters "P. T.," which stand for protective tariff. They do not say whether they will continue to stamp their nails in this way longer than November 4 or not.

ALABAMA.

The Birmingham Iron Works, although established only two years ago, has already grown to a business of considerable magnitude and importance, and the present plant will soon be enlarged fourfold, making it the largest manufactory of water, gas and steam pipe (which are made specialties) in the South. The officers of the company are John T. Hardie, president, and Wm. Hardie, secretary and general manger. The directors are John T. Hardie; J. A. Shakspeare, New Orleans, La.; J. M. Lewis, Talladega, Ala.; T. L. Hudgins, and H. M. Caldwell, Birmingham.

GEORGIA.

Geo. R. Lombard & Co., of 1016 to 1026 Fenwick street, Augusta, are the proprietors of large foundry, machine and boiler works, and are prepared to build or repair tubular and cylinder boilers, besides furnishing rivets, flues and all kinds of boiler fittings. They have recently filled an order for two large water-wheel tubes for cotton mills, with the iron tanks for the same Besides a prosperous trade in boilers, they are selling Korting injectors throughout the Southeastern States. Messrs. Lombard & Co. have lately added a number of new and improved tools to their works, where they are at present employing more than 100 hands.

The suit of the National Tube Works Company, of McKeesport, Pa., to recover from the Baltimore and Ohio Railroad Company $26,700 excessive freight charges paid by them under protest since 1875, has been decided by Master R. B. Carraher, at Pittsburgh, in favor of the railroad company.

Wholesale Hardware Prices, October 15, 1884.

HARDWARE.

Anvils.
Eagle Anvils American.....₩ ℔ 10¢—dis 20 %
Wright's.....10 @ 10½¢
Armitage's Mouse Hole.....9½¢ @ 9½¢
Armitage Mouse Hole, Extra.....11½¢
Trenton.....9½¢
Wilkinson's.....10½¢
J. & Riley Carr, Patent Solid.....11¢

Anvil Vise and Drill.
Millers Falls Co., $18.00.....dis 20 %
Cheney Anvil and Vise.....dis 25 ¢

Apple Parers.
Advance.....₩ doz $5.75
Champion.....₩ doz $8.25
Family Bay State.....₩ doz $12.00
Gem.....₩ doz $5.25
Gold Medal.....₩ doz $5.00—dis 10 %
Improved Bay State.....₩ doz $30.00
Improved Bay State, with push off.....₩ doz $33.00
Jersey.....₩ doz $7.50—dis 25 %
Little Star.....₩ doz $5.50
New Lightning.....₩ doz $7.00
Oriole.....₩ doz $7.50—dis 30 %
Penn.....₩ doz $5.50
Rocking Table.....₩ doz $7.00
Triumph.....₩ doz $5.50
Turntable, Original.....₩ doz $5.50
Turntable, Improved.....₩ doz $6.50
Waverly.....₩ doz $5.00—dis 10 %
White Mountain.....₩ doz$5.50
"1872".....₩ doz $4.50
"1876".....₩ doz $5.75
"1878".....₩ doz $7.00

Augers and Bits.
First Quality.....dis 60@60&15 %
Cook's, Douglass Mfg. Co.....dis 50 %
Cook's, New Haven Copper Co.....dis 50&10 %
Patent Solid Head.....dis 30 %
Lewis' Patent Single Twist.....dis 45 %
Russell Jennings' Augers and Bits of all kinds,
List of January 1, 1884.....dis 25 %
Imitation Jennings' Bits (old list).....dis 60 %
Ives' "Jennings'" Bits (old list).....dis 50&10 %
Car Bits, New Haven Copper Co.....dis 50&10 %
Snell Mfg. Co.'s Jennings' Bits (old list).....dis 50 %
Expansive Bits, Clark's small,$18; large,$26..dis 25&10 %
Expansive Bits, Ives' No. 4, per doz., $90.....dis 25&10 %
Expansive Bits, Blake's.....$20—dis 40 %
Expansive Bits, Derby, $17 and $20.....dis 40&10 %
Expansive Bits, Ansonia.....dis 25 %
Hollow Augers, Ives'
Hollow Augers, French, Swift & Co.... } dis 25&10 %
Hollow Augers, Douglass'
Hollow Augers, Bonney's Adjust, ₩ dz. $48..dis 40&10 %
Hollow Augers, Stearns' Adjust. ₩ dz. $48—dis 20&10 %
Hollow Augers, Ives' Expansive, each $4.50—dis 40&10 %
Hollow Augers, Universal Expan., each, $4.50—dis 20 %
Wood's.....dis 25 %
Gimlet Bits.....$7.50 ₩ gross, dis 50 %
Gimlet Bits, Diamond.....₩ doz. $1.10, dis 25&10 %
Gimlet Bits, "Bee".....dis 25 %
Double Cut Gimlet Bits, Shepardson's.....dis 45 %
Double Cut Gimlet Bits, Ct. Valley Mfg. Co..dis 30&10 %
Double Cut Gimlet Bits, Hartwell's.....dis 60 %
Double Cut Gimlet Bits, Douglass'.....dis 40 %
Double Cut Gimlet Bits, Ives'.....dis 50 %
Holtz Bit Stock Drills.....dis 25&10 %
L'Hommedieu's Ship Augers.....dis 15 %
Watrous's Ship Augers.....dis 15 %
Snell's Ship Augers.....dis 15 %

Awl Hafts.
Sewing, Brass Ferrule.....$3.50 ₩ gross—dis 40&10 %
Patent Sewing, Short.....$1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long.....$1.20 ₩ doz.—net
Patent Peg, Plain Top.....$10.00 ₩ gross—dis 40&10 %
Patent Peg, Leather Top....$12.00 ₩ gross—dis 40&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.....₩ gross $1.70—dis 25&10 %
Awls, Shouldered Peg.....₩ gross $2.45—dis 25&10 %
Awls, Patent Peg.....₩ gross 63¢—dis 25&10 %
Awls, Shouldered Brad.....$2.70 ₩ gross—dis 25&10 %
Awls, Handled Brad.....$7.50 ₩ gross—dis 25&10 %
Awls, Handled Scratch.....$7.50 ₩ gross—dis 25&10 %
Awls, Socket Scratch.....$1.50 ₩ doz—dis 25 %
Aiken's Sets, Awls & Tools..₩ doz. $10.00—dis 50&10 %
Millers Falls Adj. Tool Handles.....₩ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 1.....₩ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 2.....₩ doz $18—dis 25 %
Brad Sets, No. 42, $10.50; No. 43, $12.50....dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50.
Brad Sets, Stanley's Excelsior, No. 2, $4.00. } dis 25&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50.

Axes.—Best grades.
Regular.....per doz $6.50@$7.00
Double Steel, Bronzed.....add .75
Triple Steel, Bronzed.....add 1.00
Steel Pole, Bronzed.....add 1.00
Full Polished.....add .50
Beveled.....add .50

Double Bit Axes.
Regular, Bronzed.....per doz $12.00
Steel Pole, Bronzed.....add 1.00
Full Polished.....add 1.00
Beveled.....add 1.00

Axle Grease.
Fraser's, in bulk.....Keg ₩ ℔, 5¢; Pail, ₩ ℔, 6¢ net
Fraser's, in boxes.....₩ gross $10.00 net

Axles.—Common.....₩ ℔, 3½¢
Fine Axles.....dis 60 %

Balances.
Spring Balances.....dis 40&10 %

Bells.
Hand, Light Brass.....dis 75&10@75&10&5 %
Hand, Extra Heavy.....dis 60@65 %
Hand, White Metal.....dis 70 %
Hand, Silver Chime.....dis 25&10 %
Hand, Globe (Cone's Patent).....dis 25&10 %
Gong, Abbe's.....dis 33⅓ %
Gong, Yankee.....dis 45 %
Gong, Barton's.....dis 40&10 %
Crank, Taylor's.....dis 25&10 %
Crank, Brooks'.....dis 50&10&2 %
Crank, Cone's.....dis 10 %
Crank, Connel's.....dis 15&10 %
Lever, Sargent's.....dis 55&10 %
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....dis 25&10 %
Lever, R. E. M. Co.'s.....dis 50&10&2 %
Lever, Reading.....dis 25&10&10 %
Pull, Brook's.....dis 50&10&2 %
Pull, Western.....dis 25&10 %
Call.....dis 40 %
Cow, Common Wrought.....dis 60&10 %
Cow, Western.....dis 20&10 %
Cow, Western, Sargent's new list.....dis 60&10&10 %
Cow, Kentucky "Star".....dis 20&10 %
Cow, Kentucky, Sargent's new list.....dis 60&10&10 %
Cow, Dodge, Genuine Kentucky, new list—
Nos. 1 1½ 2 3 4 5 6 7 Hog } dis 70 %
$10.00 9.00 8.00 6.00 5.00 4.00 3.00 2.50 5.00 }
Cow, Texas Star.....dis 50 %
Farm Bells.....₩ ℔, 3½¢
Steel Alloy Church and School Bells.....dis 40 %

Bellows.
Blacksmiths' Common.....dis 50 %
Blacksmiths' Extra Pittsburgh Pattern.....dis 20 %
Molders'.....dis 25 %
Hand Bellows.....dis 20 %

Belting, Rubber.—Standard.....dis 70&5 %
Extra.....dis 60&10 %
N. Y. Belting & Packing Co., Standard.....dis 50&10 %
N. Y. Belting & Packing Co., Extra Standard..dis 50 %

Bench Stops.—Hotchkiss'.....₩ doz $5.00—dis 10 %
Weston's.....per doz No. 1, $10; No. 2, $9—dis 25&10 %
McGill's.....₩ doz $3—dis 10 %
Morrill's.....₩ doz $9—dis 50 @ 50&5 %

Bit Holders.
Extension, Barber's.....₩ doz $15.00—dis 40&5 %
Extension, Ives'.....₩ doz $20.00—dis 40 %
Diagonal.....₩ doz $24.00—dis 40 %
Angular.....₩ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic.....₩ per doz $3.00—dis 30 %
Excelsior.....₩ doz $16.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's.....₩ doz pairs, $1.00—dis 20&10 %
Van Sand's Screw Pattern.....$9 ₩ gro.—dis 20 %
Van Sand's Old Pattern.....$9 ₩ gro.—dis 20 %
Washburn's Old Pattern.....$9 ₩ gro. net
Merriman's.....new list, net
Salisbury & Austin No. 2008.....$9 ₩ gro. net
Security Gravity.....$9 ₩ gro. net

Blind Staples.
Barbed, ¼ in. and larger.....₩ ℔ 9½¢ net
Barbed, ⅜ in.....₩ ℔ 11½¢ net

Blocks.
Tackle Blocks, &c.....dis
Reed Mfg. Co. Self-Lubricating.....dis 50 %

Bolts
Cast Iron Barrel, Square, &c.....dis 60&10 c 10 %
Cast Iron Shutter Bolts.....dis 60&10&10 %
Cast Iron Chain (Sargent's list)....dis 60&10&10 @ 70 %
Ives' Patent Door Bolts.....dis 55&10 %
Wrought Barrel.....dis 55&10&10 %
Wrought Square.....dis 55&10&10 %
Wr't Shutter, all Iron, Stanley's list....dis 50&10 %
Wr't Shutter, Brass Knob, Stanley's list..dis 25&10&10 %
Wrought Shutter, Sargent's list.....dis 55&10&10 %
Wrought Sunk Flush, Sargent's .....dis 60&10 %
Wrought Sunk Flush, Stanley's.....dis 40&10 %
Wrought B. K. Flush, Corn'n Stanley's.....dis 55 %
Tire, Common, old list.....dis 85 %
Carriage, Common, list June 10,'84..dis 75&10@75&12½ %
Carriage, Philadelphia.....dis 75 %
Carriage, Philadelphia pattern.....dis 75&10 %
R. B. & W., Carriage, old list.....dis 70&5 %
Tire, American Screw Co.'s, Philadelphia, list,
Sept. 1, 1883.....dis 75&10 %
Tire, "Bay State," list, Feb. 28, 1883.....dis 65&5 %
Tire, R. B. & W., 3-16 and ¼, Philadelphia list..dis 80 %
Tire, R. B. & W., 5-16 and ⅜, Philadelphia list..dis 70 %
Stove—American Screw Co.'s.....dis 60 %
Stove, R. B. & W.....dis 60 %
Stove, B. & E. Mfg. Co.....dis 60 %
Plow.....dis 60 %
Plow, R. B. & W.....dis 50 %
Machine.....dis 75&5 @ 75&10 %
Bolt Ends.....dis 75&5 @ 75&10 %

Borax......10½¢ @ 11½¢ ₩ ℔ net

Boring Machines.

	Upright.	Angular.
First quality, no Augers...	$5.50	$6.75..dis 50@50&5 %
Phillips, with Augers.....	7.00	7.50.....net
Jennings & Co., no Augers.	5.50	6.75.....dis 45 %
Saunders' Pat., Reg. Bed..	6.00	— .....dis 20 %
Saunders' Pat., Extra Bed..	6.50	— .....dis 20 %
Hubbard's.....	3.50	3.00.....Net

Bow Pins
Humason, Beckley & Co.'s, Nos. 1 and 2.....dis 60 %
Humason, Beckley & Co.'s other Nos.....dis 70 %
Sargent & Co.'s ..$19.70 and $21.40, dis 60&10 %
Hotchkiss.....dis 30 %
Peck, Stow & W. Co.....dis 30&10 %

Braces.
Q. S. Backus.....dis 50&5 %
Barber's.....dis 40&5 %
Spofford's Patent.....dis 50&5 %
Ives' Patent Braces.....dis 55&10 %
Common Ball, American.....dis 55 %
Amidon's.....dis 50 %
Bartholomew's, Nos. 25, 27, 30.....dis 50 %
Bartholomew's, Nos. 117, 118, 119.....dis 60 %
Barker's Imp'd.....dis 60 %
Amidon's Corner Brace.....dis 30&10 %
Universal.....dis 55 %
Empire.....dis 30 %
Buffalo Ball.....dis 40 %

Brackets.
Shelf, plain.....dis 50&10&10 %
Shelf, fancy.....dis 60&10 %
Reading, plain.....dis 55&10&10 %
Reading, Rosette.....dis 60&10&10 %

Bright Wire Goods.
List of June 25, 1883.....dis 75&10 %

Broilers.—Henis' Self-Basting.

Inch	9	10	9 x 11
Per doz	$4.50	5.50	6.50

Bull Rings.
Union Nut Co.....dis 55 %
Sargent's.....dis 60&10 %
Hotchkiss' low list.....dis 30 %
Humason, Beckley & Co.'s.....dis 70 %
Peck, Stow & W. Co.'s.....dis 33⅓&10 %

Butts
Wrought Brass.....dis 80 %
Cast Brass, Tiebout's.....dis 40 %
Cast Brass, Corbin's Fast Joint.....dis 20&10 %
Cast Brass, Loose Joint.....dis 10&10 %
Fast Joint, Narrow.....dis 60&10 %
Fast Joint, Broad.....dis 60&10 %
Loose Joint.....dis 70@70&10 %
Loose Joint, Japanned.....dis 70@70&10 %
Loose Joint, Japanned with Acorns....dis 70@70&10 %
Parliament Butts.....dis 70@70&10 %
Mayer's Hinges.....dis 70@70&10 %
Loose Pin, Acorns.....dis 70@70&10 %
Loose Pin, Acorns, Japanned.....dis 70@70&10 %
Loose Pin, Acorns, Jap'd, Plated Tips..dis 70@70&10 %
WROUGHT IRON.
Fast Joint, Narrow.....dis 60&2½&10 %
Fast Joint, Lt. Narrow.....dis 60&2½&10 %
Fast Joint, Broad.....dis 60&2½&10 %
Loose Joint, Broad.....dis 60&7½&10 %
Table Butts, Back Flaps, &c.....dis 60&2½&10 %
Inside Blind, Regular.....dis 60&2½&10 %
Inside Blind, Light.....dis 60&2½&10 %
Loose Pin, Wrt.....dis 60&7½&10 %
Loose Pin, Light.....dis 60&2½&10 %
Bronzed Wrought Butts.....dis 40&5 @ 40&10 %

Spring Hinges:
Geer's Spring and Blank Butts.....dis 33⅓ %
Union Spiral Spring, Japanned.....dis 25 %
Union Spring Hinge Co.'s.....dis 25 %
American Spring Hinge Co.'s.....dis 30 %
Gem Spring Hinges.....dis 30 %
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 25 %
Buckman's.....dis 25 %
Empire.....dis 60 %
Acme.....dis 70 %
Climax.....dis 50&10 %
Blind Butts, Parker.....dis 75&2 %
Blind Butts, Palmer.....dis 50&5&10 %
Blind Butts, Seymour.....dis 70&2 %
Blind Butts, Lull & Porter.....dis 80&10 %
Blind Butts, Nicholson.....dis 45&10 %
Blind Butts, Huffer.....dis 50 %
Blind Butts, Clark's, Nos. 1, 3, 5.....dis 75&10&2 %
Blind Butts, Manhattan Hardware Co.....dis 70 %
Blind Butts, Sargent's, Nos. 1, 3.....dis 75&10 %
Blind Butts, Sargent's, No. 12.....dis 75&10&10 %
Blind Butts, Reading's Gravity.....dis 75&10 %
Blind Butts, Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55.....dis 75&10&2 %
Blind Butts, Shepard's "Gravity," Nos. 1, 3 and 5.....dis 70&10&10 %
North's Automatic Blind Fixtures, No. 2, for Wood, $9; No. 3, for Brick, $10.50.
Shepard's Lull & Porter Shutter Hinges..dis 70&10&5 %
Shepard's Reversible Shutter Hinges....dis 70&10&5 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3.....dis 60&10 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co.....dis 25 %
Bradley's.....dis 25 %
Beatty's.....dis 33⅓ %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.....dis 30&10 %

Calipers
Can Openers.....See Compasses

Messenger's Comet.....₩ doz $3.00, dis 25 %
American.....₩ gross $3.00, dis 30 %
Duplex.....₩ doz 25¢, dis 15 @ 20 %
Lyman's.....₩ doz $3.75, dis 20 %
No. 4, French.....₩ doz $2.25, dis 55 %
No. 5, Iron handle.....₩ gross $6.00, dis 30 %
Eureka.....₩ doz $2.50, dis 10 %
Sardine Scissors.....₩ doz $7.00, dis 55 %
Star.....₩ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; No. 2, $2.25; No. 3, $2.50..dis 50&10 %
"World's Best," ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....dis 50&10 %
Universal.....₩ doz $3.00, dis 35&5 %
Domestic.....₩ doz $2.50, dis 45 %
Champion.....₩ doz $2.00, dis 50 %

Caps—Percussion, ₩ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's.....50¢ } $1 40¢ less 10 per
E. B. Trimmed Edge, 1-10's.....65¢ } cent discount
E. B. Ground Edge, Central Fire, 1-10's.....70¢ }
Double Waterproof, 1-10's.....$1.40
Pistol Waterproof, 1-10's.....75¢
Musket Waterproof, 1-10's.....80¢
G. D. & S. B.....83¢, dis 10 %
Eley's E. E.....80¢ dis 10&5 %
Eley's D. Waterproof, Central Fire.....$1.50
U. M. C., F. C. trimmed.....50¢ } dis 15&10 %
U. M. C., F. L. ground.....70¢ }
U. M. C., Cen. fire ground.....70¢ } dis 10&5 %
U. M. C., Double W. Proof.....$1.40 }
Double Waterproof, in 1-10's.....$1.40 } dis 10 %
Colt's Pistol, in 1-10's.....75¢ }
Musket, in 1-10's.....80¢, dis 33⅓ %

Cartridges.
Rim.....List of Jan. 1, 1884—dis 50&10@60 %
Central Fire..... " " " dis 33⅓@40 %

Cards.
Horse and Curry.....dis 10 %
Cotton.....New list, Aug., 1883, dis 10 %
Wool..... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished.....₩ doz $5.00, dis 30 %
Cast Iron, Steel Points.....₩ doz $2.00, dis 50&5 %
Socket.....₩ doz $2.50, dis 25 %
Bullard's.....dis 25 %

Carpet Sweepers.
Bissell No. 5.....₩ doz $17.00
Bissell No. 7 New Drop Pan.....₩ doz $19.00
Bissell No. 12 Hall Sweeper.....₩ doz $42.00
Mystic.....₩ doz $17.00
Cottage.....₩ doz $15.00
Garland.....₩ doz $19.00
Queen.....₩ doz $16.00
Queen, with band.....₩ doz $18.00
King.....₩ doz $30.00

Casters.
Bed.....
Plate..... } dis 50 @ 55 %
Shallow Socket.....
Deep Socket.....dis 45 %
Yale Casters, reduced list May, 1884....dis 25&25&10 %
Martin's Patent (Phœnix).....dis 40&10 %
Payson's Anti-friction.....dis 50&10 %

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 70&10 %
Sargent's.....dis 60&10 %
Hotchkiss.....dis 30 %
Peck Stow & W. Co.....dis 33⅓&10 %

Chain.
Trace, 6½-10-2.....₩ pair 79¢ }
Trace, 6½-10-3.....₩ pair 70¢ } dis50@50&10%
Trace, 7-10-2.....₩ pair 86¢ }
German Halter Chain, list of June, 1884.....dis 55&5 %
German Coil, list of June, 1881.....dis 55&5 %
English Coil..... 3-16 ¼ 5-16 ⅜ 7-16 ½
$0.10 .09½ .07½ .06½ .06 .05¾
American Coil..... 3-16 ¼ 5-16 ⅜ 7-16 ½
$0.09¼ .06¾ .05¾ .05 .04¾ .04½
Covert Halter, Hitching and Breast.....dis 35&5 %
Meneely's Breast, Halter and Hitching.....dis 50&10 %
Oneida Halter Chain (old list).....dis 45 %
Galvanized Pump Chain.....₩ ℔ 6½¢
Jack Chain, Iron.....dis 70 %
Jack Chain, Brass.....dis 65&10 %

Chalk.
White.....₩ gro 60¢ net
Red.....₩ gro 80¢ net
Blue.....₩ gro 95¢ net
White Crayons.....₩ gro 12½¢ net

Chalk Lines.—See Lines.

Chisels.
Socket Framing, Firmer, &c.....dis 75@75&5 %
Socket Framing, Crossman.....dis 65&5 %
Socket Framing and Firmer, Buck Bros.....dis 30 %
Socket Framing and Firmer, Merrill.....dis 65&10 %
Socket Firmer, Framing, &c., L. & I. J. White..dis 25&5 %
Tanged Firmers.....dis 45&5@50 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to £
Tanged Firmers, Buck Bros.....dis 30 %

Clamps.
Iron, Providence Tool Co.'s Wrought Iron.....dis 25 %
Iron, Adjustable, Gray's.....dis 20 %
Iron, Adjustable, Lambert's.....dis 20 %
Iron, Adjustable, Snow's.....dis 40&5 %
Iron, Adjustable, Hammer's.....dis 15 %
Iron, Adjustable, Stearns'.....dis 20&10 %
Iron, Cabinet, Sargent's.....dis 70&10 %
Iron, Carriage Makers', Sargent's.....dis 65&10&10 %
Iron, Eberhard Mfg. Co.....dis 40&5 %
Saw Clamps.....See Vises

Clips, Axle.
Norway or Best.....dis 60&10 %
Superior.....dis 70&10 %

Cockeyes......dis 50 %

Cocks, Brass.
Racking.....dis 60 %
Globe.....dis 60 %
Plain Bibbs.....dis 60 %
Ale and Beer.....dis 60 %

Coffee Mills.
Board and Box.....dis 50 %
Selsor's Patent.....$9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co.....dis 20&10 %
The "Swift," Lane Bros.....dis 20&10 %
Webb's Patent.....dis 45 @ 50 %

Compasses, Dividers, &c.
Compasses.....dis 60&10 %
Calipers.....dis 60&10 %
Dividers.....dis 60&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside..dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
Cook's Extension.....dis 25 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 25 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
John Beatty & Co.....dis 33⅓ %

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 %
Clough's Patent.....dis 33⅓ %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Crow Bars.
Cast Steel.....₩ ℔ 5¢
Iron, Steel Points.....₩ ℔ 4¢

Curry Combs.
Fitch's.....dis 50&10 %
Hotchkiss, Novelty, new list, July, 1880. .....dis 33⅓ %
Hotchkiss, Excelsior Supr. Champion.....dis 33⅓ %
Rubber.....₩ doz $10.00, dis 25 %

Curtain Pins.
Silvered Glass.....net
White Enamel.....net

Cutlery.
American Pocket.....Net prices
American Table.....Net prices
Wostenholme.....$8.00 to £

Dividers......See Compasses

Dog Collars.
Embossed Gilt.....dis 30&10 %
Leather.....dis 40 %
Brass.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₩ doz $3, dis 50 %
Gem.....₩ gro, $20.00, dis 20 %
Bee Rod.....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30....dis 40&10 %

Gem (Coil):
No. 1, Large Japanned.....₩ doz $4.00 }
No. 2, Medium, Japanned.....₩ doz 2.75 } dis 50&10 %
No. 3, Small, Japanned.....₩ doz 2.00 }
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen Door size, ₩ doz $1.50 }
No. 5, Screen Door size.....₩ doz 2.00 } dis
No. 6, Medium.....₩ doz 2.75 } 60 %
No. 7, Large.....₩ doz 4.00 }
Victor (Coil).....dis 50&10&10 %
Champion (Coil).....dis 50&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 35 %
Cowell's.....No. 1, ₩ doz $15.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₩ doz $2.25, dis 20&5 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %

Drawing Knives.
Douglass & Witherby.....dis 75@75&5 %
Crossman's No. 1.....dis 70&10 %
Merrill.....dis 65&5 %
Watrous.....dis 65&10 %
L. & I. J. White.....dis 20 %
Bradley's.....dis 20&5 %
Adjustable Handle.....dis 35 %

Drills and Drill Stocks.
Blacksmiths'.....dis 20 %
Blacksmiths' Self-Feeding.....each, $2.50, dis 20 %
Breast, P. S. & W.....each, $7.50, dis 20 %
Breast, Hotchkiss'.....dis 20 %
Breast, Wilson's.....dis 20 %
Breast, Millers Falls.....dis 25 %
Breast, Bartholomew's.....each, $3.00 dis 25 %
Ratchet, Merrill's.....each, $2.50, dis 25&10 %
Ratchet, Ingersoll's.....dis 20 %
Ratchet, Whitney's.....dis 25 %
Ratchet, Weston's.....dis 20&10 %
Ratchet, Moore's Triple Action.....dis 20 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....dis 25&30 %
Wilson's Drill Stocks.....dis 20&10 %
Automatic Boring Tools.....dis 10 %
Drill Chucks.....each, $2.25, dis 20 %
Morse's Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 %
Danbury.....each, $8.00, dis 30 %

Egg Beaters.
Dover.....₩ doz $2.50
Monroe's.....dis 35 %
National.....₩ doz $4.50, dis 33⅓ %
Standard.....₩ gro, $18.00, dis25&5 %
Family (T. & S. Mfg. Co.).....₩ gro, $18.00, net
Acme.....₩ gro, $12.00, dis 25 %
Triumph (T. & S. Mfg. Co.).....₩ gro, $11.50, net

Emery.
Regular numbers.....₩ ℔ 8¢
Flour and F. F.....₩ ℔ 6½¢
For Emery Paper and Cloth, see Sand Paper.

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Brass.....dis 60 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 55 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 55&10 %
Frary's, Patent Petroleum.....dis 40 @ 40&5 %
West's Patent Key.....dis 45 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined.....dis 60 %
Cork Lined.....dis 70 %
J. Sommer's Best Block Tin Key.....dis 40& 10 %
J. Sommer's Cork Lined, 1st quality.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
Self-Measuring, Enterprise...₩ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₩ doz $36.00—dis 20&10 %
Self-Measuring, Victor.....₩ doz $36.00—dis 25&10 %

Felloe Plates......₩ 10¢, dis 30 %

Files.
J. & Riley Carr.....New list, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....New list, dis 15 %
Files of domestic make.....dis 60 %
Heller's Horse Rasps.....dis
Stubs.....dis 25 @ 30 %

Fluting Machines.
Knox, 4¼-inch Rolls.....$3.50 each }
Knox, 6-inch Rolls.....$4.00 each } dis 35 %
Eagle, 3¼-inch Roll.....$2.15, dis 35 %
Eagle, 5¼-inch Roll.....2.85, dis 35 %
Crown, 4¼ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00, ₩ doz.....dis 30 %
Shepard Hand Fluter, No. 85.....₩ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₩ doz $11, dis 40 %
Shepard Hand Fluter, No. 95.....₩ doz $8, dis 40 %
Clark's Hand Fluter.....₩ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron...₩ doz $15.00, dis 30 %
Buffalo.....₩ doz $10.00, dis 10 %

Fluting Scissors......dis 45 %

Fly Traps.
Paragon.....₩ doz $3, net

Forks.
Hay, Manure and Spading.....dis 55 %
Plated, see Spoons.

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 %

Fry Pans.
Burnished list as follows.....dis 60&10&10

No.	0	1	2	3	4	5	6	7	8
₩ doz	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

"Acme".....dis 55 %

Gauges.
Marking, Stanley's.....dis 55&10 %
Marking, Chapin's.....dis 55&10 %
Wire.....dis 10&10 %
Wire, Wheeler, Madden & Co.....dis 10 %

Gimlets.
Nail and Spike.....dis 50&10 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....dis 40&10 %
Double Cut, Shepardson's.....dis 45 %
Double Cut, Ives'.....dis 45&10 %
Double Cut, Douglass'.....dis 40 %
"Bee".....₩ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled.....dis 40 %
Family, Howe's "Eureka".....dis 40 %
Family, L. F. & C.'s "Handy".....dis 40 %

Grindstone Fixtures.
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 33⅓&10 %

Gun Wads.
U. M. C. B. E., 11 up.....$2.00 }
U. M. C. B. E., 9&10.....2.30 }
U. M. C. B. E., 7&8.....2.60 }
U. M. C. P. E., 11 up.....3.10 } dis 5&5 %
U. M. C. P. E., 9&10.....4.00 }
U. M. C. P. E., 7&8.....4.90 }
Eley's B. E.....2.00 }
Eley's P. E.....3.00 }

Hack Saws.
Griffin's Hack Saws, complete.....dis 40&10 %
Griffin's Hack Saw, Blades only.....dis 20&10 %
Star Hack Saws and Blades.....dis 25 %

Halters.
Covert's Pat. Rope.....dis 50&5 %
Covert's Hemp Horse and Cattle Ties.....dis 50 %
Covert's Jute Horse and Cattle Ties.....dis 50&10 %
Meneely's Pat. Rope and Web.....dis 40&10 %
Meneely's Horse and Cattle Ties.....dis 40&10 %

Hammers.
Maydole's.....dis 20@25 %
Cheney's, new list, March, 1883.....dis 20&10 %
Hartford Hammer Co.'s Nail Hammers..dis 25@25&5 %
Kip's.....dis 35 %
C. Hammond & Son.....dis 40&5 %
Humason & Beckley.....dis 15 %
Verree.....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75..dis 25&10%
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 10 %
Yerkes & Plumb.....dis 40 @ 40&5 %
Wilkinson's Smiths'.....11½¢ ₩ ℔ net
Heavy Hammers and Sledges.....dis 60 @ 60&10 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz..dis 10%
Providence Tool Co., Leg Irons, $25.00 ₩ doz....dis 10%
Tower's.....dis 25 %

Handles.—Door or Thumb Latches.

Nos.	0	1	2	3	4	
Per doz	$0.90	1.00	1.18	1.35	1.50	dis 60&10 %

Roggin's Latches.....₩ doz. 35¢ @ 40¢ net
Bronze Iron Drop Latches.....₩ doz. 70¢ @ 80¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door.....₩ doz. $1.40, dis 10&10 %
Wrought Chest.....dis 70 %
Surface Chest.....dis 60&10 %
Flush Chest.....dis 70 %
Lifting.....dis 60&10 %
Saw and Plane.....dis 40&10 %
Boynton's Loop Saw Handles.....50¢, dis 50 %
Boynton's Centennial Saw Handles.....30¢, dis 25 %
Hammer and Hatchet.....dis 20 %
Brad Awl.....₩ gross $2.00
Hickory Firmer Chisel, assorted.....₩ gross $4.50
Hickory Firmer Chisel, large.....₩ gross 5.00
Apple Firmer Chisel, assorted.....₩ gross 5.00
Apple Firmer Chisel, large.....₩ gross 6.00
Socket Firmer Chisel, assorted.....₩ gross 3.00
Socket Framing Chisel, assorted.....₩ gross 5.00
File, assorted.....₩ gross 2.75 } dis
Auger, assorted.....₩ gross 5.00 } 25&10 %
Auger, large.....₩ gross 7.00 }
Patent Auger, Ives'.....dis 25 %
Patent Auger, Douglass'.....₩ set $1.25 net
Patent Auger, Swan's.....₩ set $1.00 net

Hangers.
Barn Door, old patterns.....dis 60&10 %
Barn Door, New England.....dis 60&10&10 %
Climax (Anti-Friction).....dis 55 %
Zenith Anti-Friction Wood Track.....dis 40 %
Reed's Steel Arm.....dis 40 %
Challenge.....dis 50 %
"Champion" Medina Mfg Co.....$15.00, dis 50&10 %
Sterling Improved (Anti-Friction).....dis 65&10 %
Double Cut, Hartwell's.....dis 40&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18....dis 33⅓ %
Cheritree.....dis 50 %
Kidder's.....dis 50&10 %
U. S.....4 in., $12; 5 in., $15, dis 60&10 %
The "Boss".....dis 50&10 %
Terry's Patent.....5 in., $12; 3¼ in.,

Packing, Steam.
N. Y. Belting & Packing Co.....dis 50&10 %

Peach Parers.
Rotary Knife.....₩ doz $15, dis 10 %
Diamond State.....₩ doz $15, dis 10 %

Pencils.
Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Lumber.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12..dis 60&5 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13..dis 60&5 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10 %
Brass Head, T. & S. Mfg. Co.....dis 50 %
Porcelain Head, Sargent's list.....dis 50&10 %
Porcelain Head, Judd's list.....dis 40 %
Porcelain Head, T. & S. Mfg. Co.....dis 40 %
Niles' Patent.....dis 40 %

Pinking Irons......₩ doz 75¢ net

Planes and Plane Irons.
Bench, First Quality.....dis 20&10 %
Bench, Second Quality.....dis 25&10 %
Molding.....dis 15&10 %
Bailey's (Stanley R. & L. Co.).....dis 20&10 %
The Stanley (S. R. & L. Co.).....dis 20&10 %
Bailey's "Victor".....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to £
Plane Irons, Buck Bros.....$5.00 to £
Plane Irons, Auburn Tool Co.....dis 20&10 %
Plane Irons, The Globe Mfg. Co., "Baldwin Iron".....dis 20&10 %
L. & I. J. White.....dis 25 %
Plane Irons, Ohio Tool Co.....dis 20&10 %
Plane Irons, Sandusky Tool Co.....dis 20&10 %

Pliers and Nippers.
Button's Patent.....dis 33⅓ %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....dis 20&10 %
Humason & Beckley Mfg. Co.....dis 30&10 %
Gas Pliers.....dis 55 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers.....add 6 % dis 10 %

Plumbs and Levels.
Disston's.....dis 45&10 %
Stanley R. & L. Co.'s Pat. Adjustable....dis 65&10&10 %
Stanley R. & L. Co.' Non-Adjustable....dis 65&10&10 %
Chapin's Patent Adjustable.....dis 65&10&10 %
Chapin's Non-Adjustable.....dis 65&10&10 %
Standard Rule Co.'s New Adjustable....dis 65&10&10 %
Standard Rule Co.'s Non-Adjustable....dis 65&10&10 %
Johnson's Patent Adjustable.....dis 65&10&10 %
Pocket Levels.....dis 65&10&10 %
Davis' Inclinometers.....dis 20 %

Post Hole and Tree Augers.
Samson Post Hole Digger.....₩ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers.....₩ doz $36.00, dis 20 %
Eureka Diggers.....₩ doz $27
Leed's.....each $2.50
Vaughan's Hollow Tube Post Hole—
6 in., $23.00; 7, 8 and 9 in., $25.00 ₩ doz., dis 20&10 %
Kohler's Little Giant.....₩ doz $27

Potato Parers.
White Mountain.....₩ doz $5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruner.....dis 33⅓ %
Pruning Shears.....₩ doz $4.00 @ $4.50
Henry's Pruning Shears.....₩ doz $5.50 @ $5.75 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₩ doz $8.50, dis 30 %

Pulleys.
Hot House, Awning, &c.....dis 65&10 %
Japanned Screw.....dis 65&10 %
Brass Screw.....dis 70&10 %
Japanned Side.....dis 65&10 %
Japanned Clothes Line.....dis 60&10 %
Hay Fork, Solid Eye...$4.50; Swivel, $5.00, dis 50&10 %
Hay Fork, "Anti Friction".....$6.75, dis 10&10 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.
Cistern.....dis
Pitcher Spout.....dis
Yard and Set Length.....dis

Punches.
Saddlers' or Drive....₩ doz $2.00; 2.25; 2.50...dis 55 %
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring.....₩ doz $6.00, dis 55 %
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44, dis 50 %

Rail.
Sliding Door, Wrought Brass....₩ ℔ 35¢, dis 20 %
Sliding Door, Bronzed Wrt. Iron₩ foot 12¢, dis 40&5 %
Sliding Door Iron, Painted.....₩ foot 4¢, dis 20&10 %
Barn Door, Light....Inch. ¼ ⅝ ¾
Per 100 feet..... $2.50 3.00 4.40—dis 10 %
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet..... $2.15 2.70 3.25 net
Terry's Wrought Iron, 5¢ ₩ foot..... net

Rakes.
Cast Steel.....dis 50&10&60 %
Malleable.....dis 50&10&60 %

Razors.
J. R. Torrey Razor Co.....dis 20 %
Wostenholme & Butcher.....$10 to £, dis 10 %

Razor strops.
Genuine Emerson.....dis 60 %
Imitation Emerson.....₩ doz $2.00, dis 20&10 %
Torrey's.....dis 20 %

Refrigerators.
G. N. Pierce & Co.....dis 30 @ 33⅓ %
Challenge.....dis 33⅓ %
Challenge Beer Coolers.....dis 25 %

Rivets.
Black Iron and Tinned.....dis 40 @ — %
Iron in bulk.....dis 40 @ — %
Iron Carriage Rivets.....dis 40 @ — %
Tinned Iron Rivets and Burrs.....dis 40 @ — %
Copper Rivets and Burrs.....dis 50 %
Nos. 7 8 9 10 11 12 13 14 15
₩ ℔ 49¢ 50¢ 52¢ 54¢ 56¢ 58¢ 60¢ 65¢ 70¢

Rivet Sets......dis 50 %

Rods.—Stair, Brass.....dis 25 %
Stair Black Walnut.....60¢ ₩ doz, dis 10 %

Rollers.—Barn Door, Sargent's list..dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %

Rope.—Mnf'rs list, Aug. 7, 1884.....dis 1¢ ₩ ℔
Manila.....½ inch and larger ₩ ℔ 16 ¢
Manila.....⅜ inch ₩ ℔ 16½¢
Manila.....¼ and 5-16 inch ₩ ℔ 17 ¢
Manila Tarred Rope.....₩ ℔ 15½¢
Manila, Hay Rope.....₩ ℔ 16 ¢
Sisal.....½ inch and larger ₩ ℔ 9½¢
Sisal.....⅜ inch ₩ ℔ 10 ¢
Sisal.....¼ and 5-16 inch ₩ ℔ 10½¢
Sisal, Hay Rope.....₩ ℔ 9½¢

Rules.
Boxwood.....dis 75&10&10 %
Ivory.....dis 55 %

Sad Irons.
Solid.
From 4 to 10.....₩ 100 ℔ $2.70 @ $2.75
Self-Heating.....₩ doz. $9.00 net
Self-Heating, Tailors'.....₩ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons, Double Pointed.....dis 35 %
Mrs. Pott's Irons, Square Back.....dis 35 %
Enterprise Star Irons, new list, July 20, 1882....dis 35 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Chinese Laundry (N. E. Butt Co.).....8½¢, dis 15 %
New England.....5¢, dis 15 %

Sand Paper and Emery Paper.
Baeder & Adamson's Flint. 00 to 1½....$4.50 ₩ ream
Baeder & Adamson's Flint, 2, 2½ & 3.... 5.00 ₩ ream
Baeder & Adamson's Flint, assorted... 4.75 ₩ ream
Baeder & Adamson's Star.....3.75 ₩ ream
Baeder & Adamson's Emery.....₩ ream 6.50 @ 11.50 } dis 40 %
Bartles Best Flint, Nos. 00 to 1½.....₩ ream $4.50 }
Bartles Best Flint, assorted.....₩ ream 4.50 }
Bartles Best Flint, Nos. 2 to 3.....₩ ream 5.00 } dis
Bartles Best Flint, No. 3½.....₩ ream 5.50 } 40 %
Columbia Flint, all Nos.....₩ ream 4.00 }
Madison Mills Flint, all Nos.....₩ ream 3.50 }
Bartles Emery Paper.....₩ ream $6.50 @ 11.00 dis 40 %
Bartles Emery Cloth.....₩ ream 18.00@ 26.00 } dis 20 %
Crocus Cloth.....₩ ream 18.00@..... }
New England, same list as B. & A. Flint.....dis 30&10 %
Gage's.....dis 30&10 %

Sash Cord.
Common.....₩ ℔, 12½¢ @ 13¢ net
Patent.....₩ ℔, 15¢ @ 16¢ net
White Cotton Braided.....32½¢ @ 34¢ ₩ ℔ net
Common Russia Sash.....₩ ℔ 13¢
Patent " " ..... " 15¢
Cable Laid Italian " ..... " 26¢
India Cable Laid " ..... " 14¢
Silver Lake, A Quality, White.....50¢. dis 10&10 %
Silver Lake, A Quality, Drab.....55¢. dis 10&10 %
Silver Lake, B Quality, White.....50¢. dis 15&10 %
Silver Lake, B Quality, Drab.....55¢. dis 15&10 %
Silver Lake, C Quality, White (only).....34¢ net.
Spring Lake.....50 @ 55¢. dis 10&10&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris.....dis 50 %
Broughton's Burglar Proof.....dis 33⅓ %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25@33⅓ %
Hammond's Window Springs.....dis 25 %
Northam Window Springs, No. 1 $10.00 ₩ gross..dis 15 %
Common Sense," Japanned, Coppered and Bronzed.....₩ gross $5.00 net
"Common Sense," Nickel Plated....₩ gross $12.00 net
'Universal'.....dis 30 %
Kempshall's Gravity.....dis 50 %
Kempshall's Model.....dis 50&10 %
Corbin's Daisy.....dis 50&10 %
Payson's Perfect.....dis 50&10 %
Hugunin's "New" and "Improved Screw" Balances:
Malleable Iron, February, 1884, list.....dis 33⅓ %
Gray Iron, February, 1884, list.....dis 33⅓&15 %
Hugunin's Sash Locks, May, 1884, list.....dis 33⅓ %
Stoddard "Practical".....dis 10 %

Sash Weights.
Solid Eyes, in 500 lbs lots and over.....₩ ℔ 1¼¢ @ 1¾¢

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ doz. $20, dis 40 %
Perry.....₩ doz. No. 15; No. 0, $31, dis 25&10 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 25 %
Silver's.....dis 25 %

Saws.
Disston's Circular, Mill and Cross Cut.....dis 45&10 %
Disston's Hand, Panel, Rip, &c.....dis 20&10 %
Boynton's Lightning Cross Cuts, new list.....dis 40 %
Boynton's Circular and Mill.....dis 40 %
Boynton's Ice.....dis 25 %
Boynton's Lightning Hand, Panel and Rip.....dis 25 %
Wheeler, Madden & Clemson Mfg. Co.'s Hand..dis 30 %
W. M. & C. Champion X Cuts, Regular.....₩ foot 27¢
W. M. & C. X Cuts, Thin Back.....₩ foot 30¢
Livingston's Butcher and Kitchen.....dis 20 %
Livingston's Framed Wood—
Nos..... 101 102 103 104 105
Per doz..... $10.00 8.50 10.00 7.50 6.20 net
Simond's Circular.....dis 35 %
Simond's Crescent-Ground Cross Cuts, patent December 26, 1882.....dis 25 %
Peace Circular and Mill.....dis 45&10 %
Peace Hand .Panel and Rip.....dis 20&10 %
Peace Cross Cuts, Standard.....₩ foot 20¢
Peace Cross Cuts, Thin Back.....₩ foot 25¢
Peace Band Saws, all widths.....dis 20&10 %
Richardson's Circular.....dis 45 %
Richardson's Mill.....dis 45 %
Richardson's Cross-Cuts, No. 1, 31¢; No. 2, 28¢; No. 3, 26¢.
Richardson's Hand Panel, Butcher and Web Saws.....dis 25&5 %
Barry's Circular.....dis 45 %

Saw Frames.
White, Vermont.....₩ doz $1.50, dis 25&10 %
Red, Polished and Varnished.....₩ doz $1.50, dis 10 %
Saw Rods.....$10 list dis 10&10 %

Saw Sets.
Boynton's Patent X Cut, ₩ doz $12.00; Hand Saw, ₩ doz $10.00.....dis 25 %
Stillman's Genuine....₩ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imitation...₩ doz $3.25 and $5.25, dis 40&5 %
Common Lever.....₩ doz $2.00, dis 40&5 %
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's.....dis 20&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 20&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$8.00, dis 55 %
Hart's Patent Lever.....dis 20 %
Disston's.....dis 20&10 %
Morrill's.....No. 1, $15.00; No. 5, $52.00, dis 40&5 %
Croissant (Keller)...No. 1, $15.00; No. 2, $24.00, dis 40 %

Scales.
Hatch, Counter, No. 171.....₩ doz $42.00, dis 40&10 %
Hatch, Tea, No. 161.....₩ doz $15.00, dis 40&10 %
Union Platform.....$6.00, dis 55 %
Chatillon's Grocers.....dis 40 %
Chatillon's Eureka.....dis 25 %
Chatillon's Family Favorite.....dis 30 %
Family Universal.₩ dos, 12 ℔, $30.00; 24 ℔, $36.00, net
Family, Turnbull's.....dis 30 %
Scale Beams, List of January 12, 1882.....dis 55 @ 60 %
Scale Beams, Custer.....dis 25 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.).$6.50, dis 20&10 %
Box, 1 Handle.....₩ doz $4.00, dis 10 %
Box, 2 Handle.....₩ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Corners.
Porter's Pat. Window and Door Frame.....dis 33⅓ %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 40 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 27½ %
Stanley R. & L. Co.'s Varnished Handles....dis 60&10 %
Stanley R. & L. Co.'s Black Handles.....dis 50&10 %
Sargent & Co.'s Nos. 1 & 20, Forged Blade.dis 60%&10 %
Sargent & Co.'s Nos. 20 & 30, Cast Steel.....dis 55&10 %
Sargent & Co.'s No. 60, Round Blade.....dis 60&10 %
Sets interchangeable.....₩ doz $18.00, dis 25 %
Champion.....dis 25 %
Clark's Patent.....dis 20&10 %
Crawford's Adjustable.....dis 30 %

Screws.
Flat Head Iron.....dis 75 %
Round Head Iron.....dis 70 %
Flat Head Brass.....dis 75 %
Round Head Brass.....dis 65 %
Brass and Silver Capped.....dis 40 %
Japanned, list of Plain Screws.....dis 60&10 %
Lag or Coach.....dis 75&5 %
Coach, Patent Gimlet Point.....dis 75 %
Bed.....dis 33⅓ %
Machine, Flat Head, Iron.....dis 55 %
Machine, Round Head, Iron.....dis 50 %
Bench, Iron.....dis 55&10 %
Bench, Wood, Beech.....₩ doz $3.00, dis 10 %
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 %
Hand Rail, Sargent's.....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s.....dis 70 %
Hand Rail, Am. Screw Co.....dis 70 %

Scroll Saws.
Lester, $10.00.....dis 25 %
Rogers, $3.50.....dis 25 %

Scythes.

Shears and Scissors.
American (Cast) Iron.....dis 75 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....add 6 %, dis 10 %
Seymour's, List, Dec., 1881.....dis 60&10 %
Heinsch's, List, Dec., 1881.....dis 60&10 %
Heinsch's Tailor's Shears.....dis 33⅓ %
Mass. Cutlery Co. St. Trimmers.....dis 80 %
Cast Steel Trimmers.....dis 80 %
Wiss, J., & Sons' list, Dec., 1881.....dis 60&10 %
Wiss, J., & Sons' Tailors' Shears.....dis 50 %

Sheaves.
Sliding Door, M. W. & Co., list.....dis 50&10&2 %
Sliding Door, R. & E., list.....dis 60&10&2 %
Sliding Door, Patent Roller.....dis 60&10&2 %
Sliding Door, Patent Roller, Hatfield's...dis 60&10&2 %
Sliding Door, Russell's Anti-Friction.....dis 60&10&2 %
Sliding Door, Moore's Anti-Friction.....dis 60
Sliding Shutter, R. & E. list.....dis 50&10&2 %
Sliding Shutter, Sargent's list.....dis 60&10 %
Sliding Shutter, Reading list.....dis 60&10 %
Moore's Anti-Friction (Hanging).....New list, dis 25 %

Ship Tools.
L. & I. J. White.....dis 20&5 %

Shovels and Spades.
Ames' Shovels, Spades and Scoops.....dis 17½ %
Griffiths'.....dis 50&10 %
Old Colony.....dis 15 %
Groom Shovel Co.....dis 20 %
Hussey, Binns & Co.....dis 20 %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list Jan. 2, 1882.....dis 50&5 %
R. T. Pettebone, Pat. Shovels, new list.....dis 50 %
R. T. Pettebone, Pat. Scoops, new list.....dis 20 %
Remington's (Lowman's Patent).....dis 30 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's, Steel.....dis 60 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 60&10&2 %
Iron and Brass Head, P. S. & W.....dis 50&5&10 %
Polished Steel, new list.....dis 50&10&2 %

Slates.
Square Frames, by case.....dis %
Less than a case.....dis %

Spoke Shaves.
Defiance Metallic.....dis 20&10 %
Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.), new list.....dis 30&10 %
Stearns'.....dis 30&10 %

Spoke Trimmers.
Bonney's.....₩ doz $10.00, dis 50 %
Stearns'.....₩ doz $9.00, dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 55&10 %
Douglass'.....₩ doz $9.00, dis 20 %

Spoons.
Basting.....dis 70&10 %
Solid Table and Tea.....dis 70&10 %
Britannia.....dis 60&10 %
Meriden Brit. Co., Rogers.....dis 50&5 %
Wm. Rogers Mfg. Co.....dis 50&5&5 %
Holmes, Booth & Haydens.....dis 50&10 %
Holmes & Edwards Silver Co.....dis 50&10&5 %
German Silver.....dis 40&5@40&10 %
Cast Steel, Silver Plated.....dis 40 %
Tin (P. S. & W.), Teas.....$1.25 ₩ gro net
Tin (P. S. & W.), Tables.....$2.00 ₩ gro net
Tin (Cowles Hdw. Co).....dis 10 %
Tin (Cowles Hdw. Co.), case lots.....dis 20 %

Squares.
Steel and Iron.....dis 50&10&2 % } Full cases,
Nickel Plated.....dis 50&10&2 % } extra 10 %
Try Square and T Bevels.....dis 55&10 %
Disston's Try Square and T Bevels.....dis 40 %
Winterbottom's Try and Miter.....dis 20&10 %

Stocks and Dies......dis 55&10 %
"Lightning" Screw Plate.....dis 10 %

Stone.
Hindostan No. 1, 6¢; Ax, 8¢; Slips, 10¢.....dis 40 %
Sand Stone.....₩ ℔, 5¢, dis 33⅓&10 %
Washita Stone.....No. 1, ₩ ℔, 13¢ net
Washita Stone.....No. 2 ₩ ℔, 10¢ net
Washita Stone Slips.....No. 1, ₩ ℔, 32¢ net
Arkansas Stone, No. 1, 4 to 6 in.....₩ ℔, $1.35, dis 10 %
Arkansas Stone, No. 1, 6 to 9 in.....₩ ℔, $2.00, dis 10 %
Turkey Oil Stone (Chase)....4 to 8 in. ₩ ℔, 60¢, dis 10 %
Turkey Slips (Chase).....$1.75 ₩ ℔, dis 10 %
Lake Superior (Chase).....₩ ℔, 16¢, dis 10 %
Lake Superior Slips (Chase).....₩ ℔, 30¢, dis 10 %
Grindstones, Family, Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun.....₩ gro $5.75 net
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro, No. 1, large, $5.50; No. 2 small, $3; No. 3, medium, $4.

Tacks, Brads, &c.
New List, Sept. 1, 1882
Tinned Swedes Tacks.....dis 30 % }
Tinned American Tacks.....dis 30 % }
Swedes Tacks, all kinds.....dis 30 % }
American Cut Tacks.....dis 30 % }
Copper Tacks and Nails.....dis 30 % }
Swedes Hungarian Nails.....dis 35 % } extra 10&2 % on all.
Gimp and Lace Tacks.....dis 30 % }
Gimp and Lace Tacks, Tinned.....dis 30 % }
Finishing Nails.....dis 25 % }
Trunk and Clout Nails.....dis 25 % }
Common and Patent Brads.....dis 20 % }
Basket Nails.....dis 20 % }
Brush Tacks.....dis 20 % }
Leathered Carpet Tacks.....dis 20 % }
Cigar Box Nails.....dis 20 % }
Chair Nails.....dis 20 % }
Double-pointed Tacks.....dis 75@75&10 %

Tap Borers.
Common and Ring.....dis 20&10 %
Ives' Tap Borers.....Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers.....Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co.....dis 20&10 %
Clark's.....dis 20&10 %

Tapes, Measuring.
American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 %

Thermometers.
Tin Case.....dis 80 %

Transom Lifters.
Wollensak's Patent.....dis 35 %
Reiher, Imp. Lifter, list, Oct., 1883.....dis 35&5 %
Excelsior.....dis 50&10&2 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20&10 %
Wood Bottom.....₩ doz $10.00, dis 30&10 %
All Iron.....₩ doz $4.50 net
Nashua Lock Co.'s.....₩ doz $18.00 dis 50@55 %
Wilson's.....dis 50 %
Clipper (Sargent & Co.).....₩ doz $24, dis 50&10 %
Acme.....₩ doz $20.00, dis 40 %

Tinners' Tools and Machines.
Machines (P. S. & W.).....list add 20 % } dis 10 %
Tools (P. S. & W.).....add 6 % }

Traps.
Game, Newhouse.....dis 35 %
Game, Oneida Pattern.....dis 60&10 %
Game, Blake's Patent.....dis 40&10 %
Mouse, Wood, Choker.....₩ doz holes, 15¢
Mouse, Round Wire.....₩ doz $1.50, dis 10 %
Mouse Cage, Wire.....₩ doz $2.00, dis 10 %
Mouse Catch-'em-alive.....₩ doz $2.50, dis 15 %
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 20 %
Rat, "Decoy".....₩ doz $10.00, dis 10 %

Trowels
Lothrops' Brick and Plastering.....dis 20&10 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 20&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 50 %

Triers.
Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882.....dis 40 %

Twine.
BC. B.
No. 12, Flax Twine, ¼ and ⅛ ℔ Balls....18¢ 20¢ ....
No. 18, " " ¼ and ⅛ " ...17¢ 18¢ ....
No. 36, " " ¼ and ⅛ " ...17¢ 18¢ ....
No. 264, Mattrass, ¼ and ⅛ ..... 36¢
Chalk Line, Cotton, ⅛ ℔ Balls.....28¢
Mason Line, Linen, ⅛ " .....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....14¢
3-Ply " 1 ℔ Balls.....14¢
3-Ply " 1½ ℔ Balls.....13¢
Cotton Wrapping, 5 Balls to ℔.....14¢ @ 20¢
2, 3, 4, and 5 Ply Jute, ⅛ ℔ Balls.....11¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz.....17¢

Vises.
Solid Box.....dis 50 %
Solid. Peter Wright's.....15½¢
Solid. Wilkinson's.....14@15¢
Parallel, Fisher & Morris Double Screw.....dis 15&10 %
Parallel, Stephens'.....dis 25 %
Parallel, Parker's.....dis 20 %
Parallel, Wilson's.....dis 50 %
Parallel, Howard's.....dis 40 %
Parallel, Bonney's.....dis 33⅓ %
Parallel, Merrill's.....dis 15@25 %
Parallel, Sargent's.....dis 60&10 %
Parallel, Backus and Union.....dis 40 %
Parallel, Double Screw Leg.....dis 15&10 %
Parallel, Prentiss.....dis 25 %
Parallel, Simpson's Adjustable.....dis 40 %
Saw Filers, Bonney's.....₩ doz $15.00, dis 40 %
Saw Filers, Stearn's.....dis 20&10 %
Saw Filers Hopkins'.....₩ doz $17.50, dis 10 %
Saw Filers, Reading.....dis 40&10 %
Saw Filers, Wentworth.....dis 20&10 %
Cowell Hand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 35 %

Washer Cutters.
Smith's Patent.....₩ doz $12.00, dis 20&10&10 %
Johnson's.....₩ doz $11.00, dis 33⅓ %
Penny's.....₩ dos Pol. $14; Jap'd, $16..dis 55 %
Appleton's.....₩ doz $16.00, dis 60&10 %
Bonney's.....dis 30&10 %

Washers.—See Nuts and Washers.

Well Wheels......dis 60& 10 %

Wire.
Brass and Copper, new list, Jan. 18, 1884.....dis 20 %
Market, Bright and Annealed, Nos. 0 to 18.....dis 67½ %
Market, Coppered.....dis 62½ %
Market, Galvanized.....dis 55 %
Market, Tinned, Tinned list.....dis 57½ %
Stone, Bright and Annealed Nos. 19 to 26.....dis 70 %
Stone, Bright and Annealed Nos. 27 to 36.....dis 75 %
Stone, Galvanized, Nos. 19 to 30.....dis 52½ %
Stone, Tinned, Tinned list.....dis 57½ %
Tinned Broom Wire.....dis 62½ %
Cast Steel Wire.....dis 52½ %
Annealed Fence, Nos. 8 & 9.....dis 67½ %
Annealed Grape, Nos. 10 to 14.....dis 67½ %
Fence Staples.....₩ ℔ 5@5½¢
Fence Staples, Galvanized.....₩ ℔ 6@6½¢
Stubs' Steel Wire.....$6.00 to £, dis 30 %
Barb Fence.....See Trade Report
Wire on Spools.....dis 60@65 %
Steel Music Wire, Nos. 7 to 30.....$1.00 ₩ ℔
Picture Wire.....dis 55 %
Clothes Line Wire, Galvanized....₩ coil 25¢ @ 40¢ net
Wire Cloth, green, drab and black, ₩ 100 sq. ft. $2.00 @ 2.25 net

Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 33⅓ %
Baxter's Diagonal.....dis 35&10 %
Coes' Genuine.....cash in 10 days, dis 60&3 %
Coes' "Mechanics".....dis 60&10&3 %
Coes' Pattern, Malleable.....dis 70&15 %
Coes' Pattern, Wrought.....dis 75 %
Girard Standard.....dis 65&10 %
Girard Agricultural.....dis 75 %
Bemis & Call's Patent Combination.....dis 30 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Pattern.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ doz $4.00, dis 40 %
Webster's Patent Combination.....dis 25 %
Agricultural Wrenches, Eberhard.....dis 33⅓ %
Boardman's.....dis 25 %
"Always Ready".....dis 25 %
Alligator.....dis 40&10 %
Donohue's Engineer.....dis 25 %

Wringers. Per doz.
Novelty, for Common Tubs, No. 2, 10-inch....$30.00
Novelty, for Common Tubs, No. 3, 11-inch.... 34.50
Excelsior, for Stationary Tubs, No. E, 10-inch 39.00
Excelsior, for Stationary Tubs, No. F, 11-inch 43.50
Excelsior, with Folding Bench, No. A, 10-inch 48.00
Excelsior, with Folding Bench, No. B, 11-inch 52.50
Universal, No. 2½.....30.00
Universal, No. 2.....33.00
Universal, No. 1¼.....34.50
Universal, No. 1½.....39.00
Universal, No. 1.....57.00
Universal, for Set Tubs, A 2½.....39.00
Universal, for Set Tubs, E 1½.....48.00
Universal, for Set Tubs, C 1.....66.00
Adams & Co. No. 3.....30.00
Peerless No. 2½.....30.00
Peerless No. 3½.....34.50
No. 99 Improved 2½.....30.00
"Metropolitan," No. 2.....33.00
"Metropolitan," No. 3½.....30.00

Wrought Staples, Hooks, &c.—See Hooks.

sep 4 83 stp

IMPORTANT!!

"GILBERTSON'S OLD METHOD" ROOFING.

Guaranteed to be an extra-coated plate, and to contain 36 lbs. of metal to a box of I C 20x28, and 18 lbs. to a box of I C 14x20.

Guaranteed to be a better and heavier-coated plate than "M. F." or "Old Style."

"CAMARET" ROOFING.

Guaranteed to stand any test in bending. Can be hammered down and flattened out again without breaking.

Every sheet in a box to be well coated, well selected, and great attention given to squaring sheets.

Samples sent on application. Write for prices and order sample box.

GUARANTEED ROOFING PLATES.

MERCHANT & CO.,

525 ARCH ST., PHILADELPHIA. 90 BEEKMAN ST., NEW YORK.

THE JENNINGS & GRIFFIN MANUFACTURING CO.,

MANUFACTURERS OF

Mechanics' Tools and Boring Implements,

SOLE PROPRIETORS OF

THE L'HOMMEDIEU AUGER WORKS,

The Oldest Auger Works in America.

ESTABLISHED BY JOSHUA L'HOMMEDIEU IN 1818.

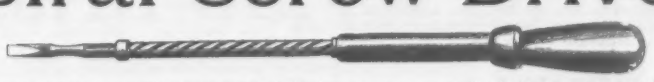
In ordering Ship Augers be sure that they bear the stamp of *"L'Hommedieu"* or *"Watrous & Co.,"* as these are our only trade-marks. Goods bearing these brands are *fully warranted* by us.

C. E. JENNINGS & CO.,

96 CHAMBERS ST. NEW YORK.

ALLARD'S PATENT

Spiral Screw Driver.



The Screw Driver herewith represented *is designed more especially for light and rapid work, and for the use of those mechanics who have large quantities of small screws to drive they are invaluable, saving many times their cost in an incredibly short time.*

Cabinet-Makers, Coffin-Makers, Carriage-Makers, Machinists, Gun and Lock Smiths, &c., will find it a very convenient tool for running in light machine screws.

DIRECTIONS FOR USING.

Grasp the handle in the right hand, taking the neck of shank between the thumb and forefinger of left hand, placing point in nick of screw, holding it there, withdraw handle gently, release the shank slightly, and press on handle, holding it firmly. To draw a screw, press the shank into the handle, and use as a common screw driver. If desired, it may be used when extended as a common screw driver by simply giving the shank a twisting jerk, causing the nut to recede and become locked.

Price $2.25. Sent by Mail, postage paid, on receipt of $2.40.

DISCOUNTS TO THE TRADE.

ALFORD & BERKELE COMPANY,

SPECIAL AGENTS,

P. O. Box 2002. No. 77 Chambers St., New York.

S. H. & E. Y. MOORE,

163 & 165 Lake St., Chicago,

HEAVY HARDWARE

AND

Railroad Supplies.

MANUFACTURERS OF

"CLIMAX" BARN DOOR HANGERS,

"ZENITH" BARN DOOR HANGERS,
For Wood Track,

MOORE'S FREIGHT CAR DOOR HANGERS,

BAGGAGE CAR DOOR HANGERS,

RAILROAD HANGERS,

PARLOR DOOR HANGERS.

Send for New Price Lists.

EASTERN AGENTS:

H. B. NEWHALL CO.,

105 Chambers St., New York. 47 Pearl St., Boston.

Fine German Silver

DRAWING INSTRUMENTS

No. 72.—Dividers, German Silver, 3 inches long, with Pen, Pencil and Needle Points, . $2.50

No. 73.—Dividers, German Silver, 6 inches long, with Pen, Pencil and Needle Points and Lengthening Bar, ... $3.00

No. 78 —Spacing Dividers, all steel, with Spring and Adjusting Screw, ... $1.25

No. 81.—Bow Pen, all steel, with Spring and Adjusting Screw, ... $1.50

No. 84.—Bow Pencil, all steel, with Spring and Adjusting Screw, ... $1.50

No. 89.—Drawing Pen, 4 to 6 inches long, German Silver, fine finish, Hinge to Pen and Protracting Pin, ... $0.75

*These

WHOLESALE METAL PRICES, October 15, 1884.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ₩ lb; provided that no Bar Iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ₩ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ₩ lb. Railroad Bars weighing more than 25 lb ₩ yard, 7-10¢ of 1¢ ₩ lb.

Standard American Pig Iron.

Foundry No. 1 X	₩ ton	$19.50 @ 21.00
Foundry No. 2 X	₩ ton	18.00 @ 19.00
Gray Forge	₩ ton	17 00 @ 18.00

No. 1 Scotch Pig Iron.

Carnbroe	₩ ton	20.50 @ 21.25
Coltness	₩ ton	22.00 @ 22.50
Shotts	₩ ton	21.50 @ 22.00
Glengarnock	₩ ton	@ 20.50
Gartsherrie	₩ ton	21.00 @ 22.00
Langloan	₩ ton	21.50 @ 22.00
Summerlee	₩ ton	@ 21.00
Dalmellington	₩ ton	@ 20.00
Eglinton	₩ ton	19.25 @ 19.50
Clyde	₩ ton	@ 20.00

Rails.

Steel, at Eastern mills	₩ ton	27.00 @ 30.00
Old Rails, Ts	₩ ton	16.50 @ 17.50

Scrap.

Wrought, ₩ ton, from yard ..... 18.50 @ 20.00

Bar Iron from Store.

Common Iron: ¾ to 1 in. round and square; 1 to 6 in. x ⅜ to 1 in	₩ lb	1.9 @ 2¢
Refined Iron: ¾ to 2 in. round and square; 1 to 6 in. x ⅜ to 1 in	₩ lb	2 @ 2.2¢
1 to 6 in. x ¼ and 5-16	₩ lb	2.20 @ 2.40¢
Rods—⅝ and 11-16 round and sq.	₩ lb	2.10 @ 2.30¢
Bands—} to 6x3-16 to No. 12	₩ lb	2.40 @ 2.50¢
"Burden's Best" Iron, base price	₩ lb	3¢
Burden's "H. B. & S." Iron, base price	₩ lb	2.6¢
Norway Nail Rods		5¼ @ 6¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
Nos. 10 to 16	₩ lb 2.70 @ 3 ¢	3¼¢
17 to 20	₩ lb 3 @ 3.12½	3¼¢
21 to 24	₩ lb 3.12½ @ 3.25	3¼¢
25 and 26	₩ lb 3.37½ @ 3.50	4 ¢
27	₩ lb 3.50 @ 3.62½	4¼¢
28	₩ lb 3.62½ @	4½¢
	B B.	2d qual.
Galvanized, 10 to 20	₩ lb	5¾¢
Galvanized, 21 to 24	₩ lb	6¼¢
Galvanized, 25 to 26	₩ lb	6¾¢
Galvanized, 27	₩ lb	7¼¢
Galvanized, 28	₩ lb	7¾¢
American Russia	₩ lb	10½¢ B, 9 ¢
Russia	₩ lb	11½¢ @ 13 ¢
American Cold Rolled B. B.	₩ lb	5 ¢ @ 7 ¢

Iron Wire. *See Wire.*

STEEL.—DUTY: Ingots, Bars, Sheets, &c., valued at 4¢ ₩ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ₩ lb, 2¢ ₩ lb; valued above 7¢ and not above 10¢ ₩ lb, 2¾¢ ₩ lb; valued above 10¢ ₩ lb, 3½¢ ₩ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¼¢ ₩ lb in addition to above; Steel Circular Saw Plates, 1¢ ₩ lb in addition to the above

American Cast Steel.

For American Steel, see Pittsburgh quotations.

English Steel.

Best Cast	₩ lb	15½¢
Extra Cast	₩ lb	16½ @ 17½¢
Circular Saw Plates	₩ lb	14½¢
Round Machinery, Cast	₩ lb	10½¢
Swaged, Cast	₩ lb	16½¢
Best Double Shear	₩ lb	15½¢
Blister, 1st quality	₩ lb	14 ¢
German Steel, Best	₩ lb	10 ¢
2d quality	₩ lb	9 ¢
3d quality	₩ lb	8 ¢
Sheet Cast Steel, 1st quality	₩ lb	15½¢
2d quality	₩ lb	14½¢
3d quality	₩ lb	12½¢

TIN.—DUTY: Plates, Sheets, Tagger and Terne, 1¢ ₩ lb; Bars, Block and Pigs free.

Banca	₩ lb	20½¢ @ 21 ¢
Straits	₩ lb	19 ¢ @ 19½¢
English	lb	20½¢ @ 21 ¢
Bar	₩ lb	20½¢ @ 21 ¢

Charcoal Tin Plates.

C 10x14 } I C 12x12 }	225 sheets	₩ box $5.50	@ $6.25
I C 20x28, 1	"	" 11.00	@ 12.75
I X 10x14 } I X 12x12 }	225 "	" 6.75	@ 7.75
I X 14x20, 112	"	" 6.75	@ 7.75
D C 12½x17 100	"	" 5.25	@ 5.50
X 12½x17 100	"	" 6.50	@ 7.00
each additional X add	"	"	@ 1.50

Coke Tin Plates.

	Best.	Ordinary.
I C 10x14 } I C 14x20 }	$5.37½	$5.00 @ .....
I C 12x12	5.50	5.25 @ .....
I C 10x20, gutters, 225 sheets	8.25	7.75
I C 20x28, 112 sheets		10.50

Terne Plates.

	Prime Char.	2d. quality	Coke.
C 14x20 M F	7 25		
I C 14x20 Tregoning, Old Process			$7.00
I C 20x28	"	"	14.50
I C 14x20	$5.00 @	$4.00 @	$4.75 @ 4.87½
I X 14x20	6.50 @		
I C 20x28	10 00 @ 10.25	9.75 @	9.50 @ 9.62½
I X 20x28	13.00 @		
I C 20x200	13.50 @		

Tin Boiler Plates.

IXX 14x26, 2 sheets for No. 7, 112 sheets		@	$13.50
IXX 14x28, 2 " " No. 8, "		@	14.50
IXX 14x31, 2 " " No. 9, "		@	16.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 2¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	₩ lb	13¼¢ @ 13⅝¢
Ingot, Baltimore	"	12¾¢ @ 12⅞¢
Braziers' Copper, ordinary sizes, 16 oz. ₩ sq. ft. and over		@ 22 ¢
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ₩ sq. ft.	"	@ 24 ¢
Braziers' Copper, 10 oz. and 12 oz. ₩ sq. ft.	"	@ 27 ¢
Lighter than 10 oz. ₩ sq. ft.	"	@ 29 ¢
Circles less than 84 in. in diam.	"	@ 25 ¢
" 84 in. diam. and over	"	@ 28 ¢
Segment and Pattern Sheets	"	@ 25 ¢
Locomotive Fire-Box Sheets	"	@ 28 ¢
Sheathing Copper, over 12 oz. ₩ sq. ft.	"	@ 19 ¢
Bolt Copper	"	@ 23 ¢
Copper Bottoms	"	@ 22 ¢
Nickel-Plated Sheathing	"	@ 35 ¢
" " for boilers	"	@ 37 ¢
Plating extra	" 25 ¢	@ 37 ¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes	"	@ 23 ¢

Tinning.

14x48, by the case	₩ sheet	8¢
14x48, less than case	"	8¢

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net.

14x48

2 and 16 oz. and heavier..35¢ By the case. ₩ lb 34¢
12 oz. and lighter.....38¢ " " " 37¢

Boiler Sizes.

7 in., 14x72. 8 in., 14x56. 9 in., 14x20.

14 and 16 oz. and heavier..37¢ By the case. ₩ lb 36¢
(And all sizes not over 20 in. wide.)
14 and 16 oz. and heavier ₩ lb 39¢
12 oz. " 42¢

Copper Wire.—*(See Wire.)*

Sheathing Metal.

Yellow Sheathing Metal, ₩ lb ..... 20 @ ...

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884 ..... dis. 20 %

LEAD.—DUTY: Pig, $2 ₩ 100 lb; Old Lead, 2¢ ₩ lb; Pipe and Sheet, 3¢ ₩ lb.

American	4 @ 4.12½¢
Bar	4½ @ 4¾¢
Pipe	5¾¢
Block Tin Pipe	40¢
Tin Lined Pipe	15¢, dis 20 %
Sheet	6¼¢, dis 20 %
Shot	Drop, 6¢; Buck, 7¢
Chilled Shot	7¢

ANTIMONY.

Hallett's	₩ lb	11 @ 11¼¢
Cookson	"	11 @ 11½¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ₩ 100 lbs.

American, cash	4¾¢ @ 5¼¢
Bergenport	9¢

ZINC—Duty: Pig or Block, $1.50 ₩ 100 lbs. Sheet, 2½¢ ₩ lb.

600 lb casks	5 50 @ 5.62½¢ ₩ lb.
Zinc.—Open	6 @ 6¾¢
Zinc Tubing	dis. 10 @ 20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U	₩ lb	7 @ 7.50¢

A. 28¢; B, 22¢; C, 14¢.

WIRE.

Iron Wire.—Put up in 68 lb bundles.

Nos.	00 to 9,	10,	11,	12,	13,	14,	15,	16,	17,	18.
		10	11	11½	12½	14	15	16		
Bright Market Wire									dis 65 %	
" Charcoal									dis 47½ %	
" Bale Wire, Nos. 7 to 12									dis 60 %	
Annealed Market Wire										
" Fence Wire, Nos. 8 and 9									dis 65 %	
" Grape Wire. Nos. 10 to 14										
" Bessemer Steel Wire									dis. 57½ @ 60 %	
Coppered Market Wire									dis. 60 %	
" Bale Wire, Nos. 7 to 12									dis. 60 %	
Galvanized Market Wire									dis 50 %	
" Fence Wire										

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis. 62½ @ 65 %
19 to 26	" 65 @ 67½ %
27 to 36	" 67½ @ 70 %
Galvanized Stone Wire	" 45 @ 50 %

Steel Wire.

Cast Steel, Stee Wire list ..... dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1 00	1.04	1.79
" 38	1.80	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

⅛ & ¼, Warranted	12½ @ 13 ¢
Extra	11½ @ 11¾¢
No. 1 Refined	10¾ @ 10¾¢
No. 2 "	10 @ 10¼¢
Extra wiping	10½ @ 11 ¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 40 %
In bulk, new list, Dec. 10, 1881	dis. 40 %
Copper Rivets and Burrs	dis. 50 %

Nos..	7	8	9	10	11	12	13	14	1
₩ lb..	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 60 %
R. B. & W.	dis. 60 %
R. & E. Mfg. Co.	dis. 60 %

FRENCH GLASS.

Prices current per box of 50 square feet.
List, September 8, 1884.

Single Thick.

Sizes.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15	$9.50	$8.50	$7.50	$7.00
11 x 14 to 16 x 24	10.50	9.50	8.75	8.00
18 x 22 to 20 x 30	12.50	11.00	10.25	9.50
15 x 36 to 24 x 30	14.00	12.75	11.00	
26 x 28 to 24 x 36	15.00	13.50	11.75	
26 x 36 to 26 x 44	16.00	14.50	12.25	
26 x 46 to 30 x 50	17 50	16.25	13.75	
30 x 52 to 30 x 54	19.00	17.00	15.00	
30 x 56 to 34 x 56	20.00	18.00	16.00	
34 x 58 to 34 x 60	22.00	20.00	18.00	
36 x 60 to 40 x 60	24.00	22.00	20.00	

Double Thick.

Sizes.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$10.75	$10.00	$9.00
11 x 14 to 16 x 24	14.00	12.75	11.75	10.7
18 x 22 to 20 x 30	17.00	15.50	14.50	
15 x 36 to 24 x 30	18.50	17.00	15.00	
26 x 28 to 24 x 36	20.00	18.00	16.00	
26 x 36 to 26 x 44	21.25	19.75	17.00	
26 x 46 to 30 x 50	23.50	21.25	18.75	
30 x 52 to 30 x 54	24.50	22.25	20.25	
30 x 56 to 34 x 56	26.50	24.50	22.25	
34 x 58 to 34 x 60	29.00	27.00	25.00	
36 x 60 to 40 x 60	32.00	30.00	28.00	

Sizes above—$15 per box extra for every 5 inches. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket. An additional 10 per cent. will be charged for all Glass more than 40 inches wide. Discount 60 and 10 %.

PAPER STOCK, &c.

(Dealers' Selling Prices.)

	Cents	₩ lb.
White Shirt Cuttings, No. 1	7 @	7½
" " No. 2	5½ @	6
Mill Assorted Whites	6 @	6¼
Unbleached Muslins	5¾ @	6
City Whites, No. 1	5 @	5¼
New Canton Flannels	5 @	5½
New Seconds, light	4 @	4½
" dark	3½ @	3¾
No. 2 Whites	3½ @	4
Cotton Canvas	5 @	5¼
Linen Canvas No. 1	4½ @	4¾
Seconds, City No. 1	1¾ @	1¾
Seconds, City No. 2	1 @	1¼
Colors, ₩ cwt	40 @	50
Manila Rope	3 @	3½
" Tarred	2½ @	2¾
Gunny Bagging, No. 1	1¾ @	2
" No. 2	1¾ @	1¾
Kentucky Bagging	4 @	...
Burlap Bagging, No. 1	1¾ @	2
Tar Shakings	1¾ @	2
Hemp Twine Stock	3¾ @	4
Hard White Shavings, No. 1	3¾ @	4
Soft White Shavings, No. 1	3 @	3¼
White Shavings, No. 2, Soft	2½ @	2¾
Mixed Shavings, part White	2¼ @	2½
Ledger and Writing	2¾ @	3
Solid Stock	2¼ @	2½
Book Stock, No. 1, light	1 @	1¼
Old Newspapers	1¼ @	1¾
Pure Manilas	1¾ @	...
Bogus Manilas and Hardwares	¾ @	1
Commons, ₩ 100 lb	60 @	70
Binders' Board Cuttings	¾ @	1
Straw Board Cuttings, ₩ cwt	70 @	75

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'	₩ lb	22 @ 24¢
" " Ordinary		6¢
" Ivory Drop, fair		12 @ 15¢
" " best		23¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢	
Blue, Prussian, fair to best		40 @ 55¢
" " in oil		45 @ 55¢
" Chinese dry		70¢
" Ultramarine		18 @ 30¢
Brown, Spanish		1¼¢
" Van Dyke		10 @ 12¢
Green Chrome		15 @ 23¢
" " in oil		14 @ 18 @ 25¢
" Paris	good, 20¢; best, 25¢	
" " in oil	good, 30¢; best, 35¢	
Iron Paint, Bright Red	₩ lb	2¼¢
" Brown	"	1¼¢
" Purple	"	3¢
" Ground in oil, Bright Red	"	6¼¢
" " " Red	"	5½¢
" " " Brown	"	5½¢
" " " Purple	"	8¢
Mineral Paints		2 @ 4¢
Orange Mineral		10¢
Red Lead, American		7¢
" Venetian (Eng.) dry		$1.65 @ $1.70
" " in oil	asst'd cans, 11¢; kegs, 8¢	
" Indian Dry		9 @ 12¢
Rose Pink		10 @ 13
Sienna, American Raw, powdered		4½¢
" Burnt, powdered		8¢
" " in oil		10 @ 16 @ 20¢
" Raw		11 @ 15 @ 25¢
Umber, Burnt, powered		4 @ 8¢
" " in oil		9 @ 12 @ 16¢
" Raw, powdered		8½ @ 7½¢
" " in oil		10 @ 16 @ 48¢
Vermilion, Chinese		90¢
" English		46 @ 48¢
" American, Common		15¢
White Lead, American, pure dry		6¢
" " " " in oil		6¢
White Paris, English Prime		2 @ 2½¢
Yellow Ochre, French		$1.75
" " in oil	asst'd cans, 11¢; kegs, 8¢	
" " Vermont	in casks, 1¼¢	
Yellow Chrome		17 @ 27¢
" " in oil		14 @ 18 @ 25¢
Zinc White, American No. 1, dry		5 @ 6¢
" " No. 1, in oil		9¢
" French (Paris Dry)		6 @ 8¢
" " in oil		10 @ 11¢

Oils.

Linseed, Raw, in casks and bbls	53 @ 54¢
" Boiled, "	56 @ 57¢
Bleached Whale, ₩ gal	63¢
" Sperm	$1.08
" Elephant	70¢
Signal	65¢
Prime Lard	63¢
No. 1 Extra	57¢
West Virginia	8 @ 12¢
Drilling	40¢
Miners' Oil	38 @ 42¢
Fish Oil, Pressed	38 @ 40¢
Neatsfoot	61 @ 72¢
Tallow	63 @ 68¢
Empire Cylinder Oil	65¢
Machinery	40¢
Engine	50¢

Sundries.

Asphaltum, Cuban		6½ @ 9½
" Egyptian		9 @ 10¢
Benzine	₩ gal.	9 @ 10¢
Chalk		3½¢
" Block		5½¢
Dryers, Patent American	asst'd cans, 9¢; kegs, 7¢	
Frostings		40c
Glue, White		24 ₩ 35¢
" Sheet		20¢
Glaziers' Points, Zinc		8¢
Gum, Copal		38¢
" Damar		25¢
" Shellac, English		40¢
" " " dark		35¢
Litharge		7½c
Mineral Wool, ordinary, ₩ lb		1 @ 1¼¢
" " extra		3 @ 3½¢
Pumice Stone, selected Lumps		4 @ 6¢
" " powdered		$2.75
Pine Tar, bbls		$2.37½
Pitch		$1.65
Putty, in bladders		3¢
" in bulk		2½c
Rosin—Common and Good—Strained		$1.60
" E & F		$1.65 @ $1.75
" G & H		$1.85 @ $2.00
" I & K		$2.40 @ $2.75
" M & N		$3.45 @ $4.00
Spirits Turpentine, ₩ bbl		32 @ 33¢
Whiting, Spanish		1¼¢
Waste, No. 1 Cop		9½¢
Waste, No. 1 White Machine		9½¢
Waste, No. 2 White Machine		8¢
Waste, No. 1 Colored		7c
Waste, No. 2 Colored		6½¢
Waste, Washed Machine		9¢

McMaster's Universal Box Strap and Corner Irons.

Indispensable to shippers for strapping all kinds of Boxes Crates and Packages for transportation. Needed at every Railroad Station and Freight Depot for instantly securing improperly secured or broken packages of every description.

Every Manufacturer, Farmer and Mechanic needs them for both permanent and general repair work, securing the corners of Egg Cases, Feed Boxes, Wood Boxes, Fruit Crates, &c.; repairing broken down Gates, split and broken Wagon Rims, Wood Seat Chairs and Benches, and general repairing in the Shop and on the Farm.

McMASTER'S SHELF SUPPORT.

Patented Jan. 29, 1882, and patent applied for on improvement.

For Shelving Stores, Bookcases, Butteries, &c.

A perfect self-sustaining Bracket.

Shelves practically adjustable and **guaranteed to sustain 1-4 ton.**

Cheaper than any other method of shelving.

No dadoing, no cleats, and no nails required.

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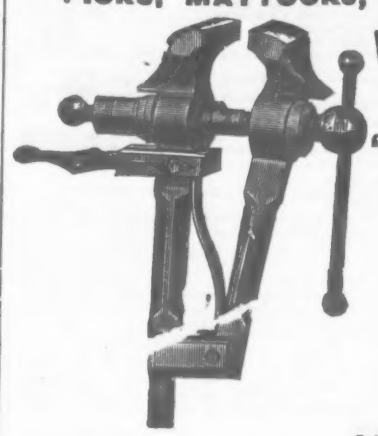

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(P. W. PATTERN.)

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AND

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FROST'S PATENT THILL SPRING.

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Every pair warranted for one year, and **NO RATTLE**. I take all the risk, you take none. Send for Circular and Price List to

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Cor. Railroad and Hancock Aves., BRIDGEPORT, CONN.

COLD ROLLED IRON AND STEEL,

Smooth Finished and Even Gauge as low as 30 Stubbs, and up to 7 Inches width; Annealed and free from Scale; Coiled or Cut to Lengths; Bright Rolled when required; Adapted for Feeding Automatic Machinery and for Nickel-Plating. Plain and Lock-Seamed Steel Tubing. Steel for Bells, for Skate Plates, for Cupping and Blanking, and for light metallic goods generally. Wilmot's Patent Lightning Rods to order.

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GRAY IRON CASTINGS.

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MANUFACTURERS OF MANILA, SISAL AND TARRED

CORDAGE OF ALL KINDS.

BINDER TWINE A SPECIALTY

E. M. FULTON,
D. B. WHITLOCK,
A. W. LUKENS,

46 South Street, NEW YORK.

On Recent Improvements in the Method of the Manufacture of Open-Hearth Steel.*

Early in the year 1875, in a report I then prepared with reference to Siemens steel works, I made the following remarks: "I am desirous of stating what I hold necessary to be done in order to keep abreast with the Bessemer steel-makers in this and other countries. I am convinced that, with existing arrangements and appliances, very little, if any, further economy in manufacture can be accomplished; and I am doubtful if we are not even now beaten by other manufacturers, with the certainty that this will be the case when the improvements now being gradually adopted by the Bessemer manufacturers are more fully and perfectly realized. Feeling this, I take it to be a matter of life or death to the company that many and extensive alterations should be at once adopted; and I have given much anxious thought to the question of what should be done in this serious emergency."

At that time nearly the whole of the steel made by the Siemens process was used in the making of rails, and I undertook that, if my proposals were adopted, I would reduce the then cost of rails by about £1 per ton. Unfortunately, this could not be done, and we had a lingering, miserable existence until the introduction of ferromanganese by our French friends enabled us to turn our attention to the production of special classes of steel—first plates, angles, &c., for use in ship, bridge and boiler construction, and next material to be used in substitution of the best charcoal iron, then solely used in the manufacture of the finest qualities of tin plates. I need not refer at this time to all the many and varied obstacles with which we had to contend in introducing what used to be called the "new material;" many of them have been more less made known to you in the past years. Suffice it to say that the enormous growth of the consumption of "mild steel" for these and other purposes enabled the makers of Siemens steel to abandon the uprofitable manufacture of rails for the remunerative one of which I have just spoken; but earlier in our history there was no other outlet for our steel.

At that time each furnace had a large staff of highly-paid men to work it, and yet it was considered very good work indeed when 50 tons of ingots were made in one week, even at the newer and larger furnaces. The total cost of labor in the melting shop (including the labor at the gas-producing works) was not less than 14/ per ton on the ingots made. My desire was to largely reduce this excessive cost of labor, as well as the cost of repairs, the consumption of fuel, and the standing charges; and I expected to accomplish my purpose by remodeling the shop and other arrangements for working, by largely increasing the capacity of the melting furnace, and consequently, it was hoped, its productive power. As I have said, circumstances did not then admit of the proposed changes being carried into effect, but in the following years some of these proposals were carried out (both by myself and others), and my expectations were more than realized. With a modern 12-ton Siemens furnace "good work" requires that 140 to 150 tons of ingots shall be made weekly per furnace, while in some "special" cases the make has reached 200 tons of ingots in one week from one furnace.

It is perhaps superfluous for me to add that the result of all this was that, on the whole, the makers of Siemens steel had for a time a fairly remunerative business. Recently, however, the demand for these products has been more than equaled by the largely increased and increasing powers of production, and the competition for the business offering has been so keen that the margin of profit, becoming gradually narrowed the last two or three years, has now almost, if not entirely, disappeared. At our last meeting in London, in the course of discussion on a kindred topic, we were told that, if "skill and brains" were brought to bear on our operations, the cost of making steel plates, &c., could be so reduced that we should, by selling more cheaply, create such an increased demand that all our works would be kept fully, constantly, and, it might be, profitably, employed. That our brains have been sorely exercised during the last anxious year or two "goes without saying," but it is not for me to say whether the needful "skill" has been exercised as well.

I have already referred in brief terms to the improvements made by ourselves at our Newton Works, and by others in the erection of the newer works called into existence by the great demand for "mild steel." I would now direct your attention to the more recent efforts in the direction of improvements in which I have been anxiously engaged. The remodeling of the Blochairn Works, after they were acquired by the Steel Company of Scotland, gave us the opportunity of embodying in our newer practice the results of our previous experience at Newton, more especially in the melting department which had to be created. My first plans were for a shop with 20 12-ton furnaces, afterward modified to 12 15-ton furnaces. I had for some time been extremely anxious to try the "Pernot" furnace, in which I thought I recognized the means by which we—open-hearth steel-makers—might most readily avail ourselves of the basic process, then exciting so much attention and causing some of us so much anxiety. Now the opportunity offered, and the first furnaces erected were two 20-ton Pernots. These were hurried on as quickly as possible, so that by the results obtained from them I might be guided in deciding what type of furnace should be adopted for the whole shop. They were fine furnaces, admirably designed and constructed, as we had the advantage of some drawings given me by our lamented friend, Mr. Holley. The mechanical arrangements were perfect, but the results were not satisfactory. I have never felt satisfied with the results of those trials, but in our then circumstances I was compelled to stop them after three months' trial, and we proceeded to erect, as rapidly as possible, Siemens furnaces, as perfect in every respect as we could make them.

Perhaps, as I am now speaking of furnaces, it will be most convenient for me to state that in 1880 we made experiments, extending over some weeks, with a Siemens furnace lined with basic material, under the personal superintendence of Messrs. Thomas & Gilchrist. We had to abandon the process principally on account of the difficulties and troubles caused by the fluxing of the lining at the lines of division of the basic and acid material, in spite of every precaution then possible to us. I may also state that for some months past we have had at work furnaces of the type known as the "Batho" furnace, and, although time is required for the realization of all the economies promised by the inventors, we have been so satisfied with their suitability to our circumstances that my directors have arranged for a few more to take the places of the older Siemens furnaces which now require to be renewed. In this connection I may also be allowed to call attention to a valuable modification of the Siemens furnace, known to us as the "Hackney" port. So satisfied are we of the advantages derived from its use that this modification will be made at all our melting furnaces as they are stopped for repairs. I need not make any special reference to another type of furnace which we have had in use for some months, as it is to form the subject of a special paper by Mr. Dick.

As I have already indicated, we erected at Blochairn a row of 12 15-ton furnaces; the ingots were cast in one long pit, parallel to and close in front of the furnaces, the tops of the ingots being level with the general floor, so that bogies or wagons could be rapidly passed to other departments. The charging floor was, of course, at a higher elevation, approached by a slight incline at one end of the shop. We had so fully realized at Newton the serious disadvantage and loss due to the relative positions of the hammers and mills and the melting shop that we were constantly devising schemes to obviate them. At Blochairn I made these relative positions such as would, I hoped, enable us to transfer the ingots from the casting-pits to the hammers at a temperature that would perhaps allow us to dispense with reheating, or, at all events, to reduce this reheating to a minimum. My hopes were not fulfilled. When we tried to hammer the ingot with only its initial heat we either found the center too soft (and it would spurt out when struck by the hammer), or, on the other hand, the outside was so cold and hard that it cracked and the slab could only be roiled into a defective plate. With regard to the charging of the ingots hot into the reheating furnace, my purpose was to a large extent frustrated by what may seem a trivial cause, but yet one which, in reality, was very difficult to deal with. The 12 melting furnaces were so many independent centers of operation. The men came in on Sunday night and charged their furnaces all at the same time, with about the same weight of charge, and as a matter of course all of them were ready for tapping about the same time on the Monday morning and all through the succeeding week, except in so far as this was affected by the slight variations in the speed at which the furnaces were working. Thus we would have the whole of the furnaces cast within a short time of each other, and a crowding of ingots to the reheating furnaces; then a long pause of 12 or 14 hours, followed by another rush of casting. During the pause the ingots were, of course, getting cold, and, as they were mostly of large size, this was a serious matter, not alone on account of the cost of reheating them, but because of the cracks which were set up both in the course of cooling and reheating.

It is obvious that the cure for all this was to make the furnaces charge and cast in succession; but there were many reasons why this could not be done at that time; into these I need not now enter. I have said that we were incessantly at work on this matter of preventing the ingots getting cold, especially at Newton, where we suffered more than at Blochairn. At last I devised and experimented with what I may term a movable set of soaking-pits for conveying the ingots to the hammers shortly after they were cast. By this means I was able to accomplish the hammering of the ingots into slabs without reheating. Subsequently, however, my directors authorized me to arrange with Mr. Gjers for the use of his patent soaking-pits, and the outcome of this decision has been the practical remodeling of all our working arrangements, which I will presently describe. Our first intention was to put the soaking-pits down in convenient relation to the hammers at one end of the melting shop, but further consideration led me to determine against this course. For two years or so previously we had been cogging part of the slabs for plates as a matter of necessity, as we had not sufficient hammer-power at Blochairn to meet all demands. We had found the plates made from cogged slabs equal to those made from hammered slabs, and with proper mechanical arrangements we saw that we could make the former at a somewhat less cost than the latter, especially in the case of very heavy slabs. Further, on many occasions I had had serious difficulties with the hammermen. Now, having arrived at a crisis, I determined, as far as possible, to substitute cogging for hammering.

The most convenient position for the proposed new cogging mill and soaking-pits seemed to be about the center of the line of melting furnaces, where, fortunately, there was an available engine of about sufficient power to work the mill. When, however, we came to consider the mode of working, I saw that the crucial point was the delivering of the ingots to the soaking-pits in something like regular succession, and I was again brought face to face with the old difficulty regarding the casting of the furnaces, as well as with the difficulty of conveying the ingots from the casting to the soaking-pits. We gave a great deal of thought to this matter, and I had some conversation thereon with Mr. Gjers. At last it was decided that it would be better to make one central casting-pit for all the furnaces, with the object of compelling successions of castings and of avoiding the necessity for carrying the ingots. This decision also enabled me to accomplish another long-desired end, which was to obtain the advantage due to agitating the steel. Failing Mr. Allen's "Agitator," which we could not conveniently use in our works, I saw the possibility of adopting the method of pouring from one ladle to another, which had been so successfully inaugurated by Mr. Gjers at Darlington, and this was kept in view as a principal object of the changes and alterations contemplated.

The 12 melting furnaces of the Blochairn Works are designated by the letters A to M inclusive. The M furnace is sufficiently large to hold a charge of 25 tons; all the rest are known as 15-ton furnaces. In front of and parallel to the furnaces are lines of railway, of which the nearest runs over the old casting-pit, which has been filled up except at a few points where it has been left open as provision for casting in the case of any accident to the machinery in the new arrangements. On this railway runs a small locomotive, which moves from point to point in front of the furnaces, a special carriage conveying a ladle for the steel and a mold for the slag. A specially-designed hydraulic lift of 20 tons power is erected between the furnaces E and F, and directly over the railway just referred to. Directly in front of this lift is a 20-ton casting crane of ordinary type, except that it is not made to lift. It is, however, provided with hydraulic engines for turning it on its axis, and also carries on one side a small cylinder and ram for turning over the casting ladle after each cast, so that any slag or skull may be easily cleared out, and the nozzle pot may be readily changed. This crane is placed in the center of a semi-circular casting-pit 40 feet in diameter and about 3 feet deep.

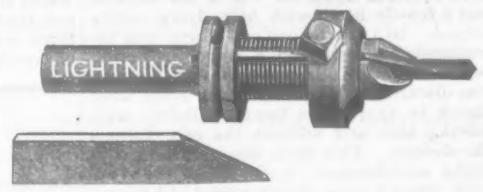
At convenient points round the casting-pit are erected three ingot cranes, each capable of lifting 5 tons, in two powers of 3 tons and 2 tons each. Between the cranes are two sets of soaking-pits, each with six cells of differing capacity for ingots of 30 cwt. or 60 cwt. each. The two outer cranes set the molds in the pit ready for casting, and afterward strip the ingots and deposit them in the soaking-pits. The center crane lifts the ingots from the soaking-pits and places them vertically on the tipping carriage at the end of the feed-rollers of the cogging mill. A hydraulic cylinder and ram are placed convenient to this tipping arrangement. The ram, taking hold of an arm of the carriage, turns it down, so that the ingot is deposited easily and without shock on the feed-rollers of the mill. The cogging mill has hollow steel rolls, with 32-inch centers, and having edging grooves at each end, the top roll being balanced by hydraulic power in cylinders placed under the bed-plate, and having a lift of 14 inches. Instead of turning the screws in the ordinary manner, the boxes are made to revolve, motion being communicated from a small Willans engine through a shaft carried on the top of the housings, and having two worms taking into worm-wheels fixed on the screw-boxes. Between the feed-rollers of the mill are arms designed for handling the ingot, which is turned by them on flat or edge and placed in front of the grooves, as may be desired, the arms being actuated by hydraulic cylinders placed under the feed-rollers. This mill is in charge of and operated by one man, assisted by two boys, one of whom works the screwing gear at the rolls, and the other the turning and the feeding gear. The mill is driven by an engine with two cylinders, 36 inches diameter and 4 feet stroke, and is geared 2¾ to 1. The steam pressure is 90 pounds, cut off at three-quarters stroke. The rolls make 28 revolutions per minute, and have a periphery speed of about 180 feet per minute. A set of hydraulic shears is in course of construction, having a working pressure of 1000 tons and calculated to shear slabs 24 inches by 8 inches in section. These will be placed behind the mill and will have feed-rollers, which will receive the slab from the mill and pass it on and through the shears to carriages which convey the slabs to the reheating furnaces of the plate mills. Having thus described the apparatus, I may now describe the *modus operandi*. The melting furnaces are charged in rapid succession on the Sunday night, and, on one coming ready for tapping (about 12 hours later), the locomotive places the carriage and ladle in front of the furnace, the charge is tapped into the ladle, the whole of the steel and slag being run into it, while the latter overflows into the slag-mold on the carriage. By this means we save the steel which ordinarily is found at the bottom of the slags in the pool in front of the furnace, and we have the slag in such a form and so free from steel that it is easily disposed of without the necessity of being broken up. Being brought under the lift, the ladle is raised until certain brackets or horns placed on each side of its pouring-lip come in contact with brackets attached to the lift, and so placed that they keep the pouring-lip of the ladle in the same horizontal plane until all its contents are discharged into the second or casting ladle, which is easily brought about by continuing the lifting of the ladle after the pouring-lip has become stationary in the brackets. The casting crane, having received into its ladle the whole contents of the first ladle, is now moved round over the molds in the casting-pit, into which the charge is cast in the ordinary manner. The time occupied by the operations of tapping the furnace, transferring the steel to the second ladle and casting into molds is 14 to 15 minutes, a shorter time than is required by the old method. You will have noticed that this arrangement for transferring the steel obviated the necessity for a lifting casting crane.

This transferring of the steel was a source of great anxiety to us all. It was known to us that some method of transferring had been tried elsewhere, and had been found impracticable. We also knew that the temperature of Siemens steel is much lower at the time of tapping than is that of Bessemer steel, and it was feared that the charge might be so chilled in the operation that it could not be cast through the nozzle of the second ladle, or that, if this were done at all, a heavy skull would be left in the ladle. Neither of these evil results has been experienced, the fact being that we have less skull now than we had under the old practice. The men know that if they cast their charge short of heat this will inevitably be discovered and they will suffer, and the ladles, being constantly employed, are kept hotter, so that the first steel poured into the second ladle is very hot, and is not chilled when it falls on the bottom. After standing about 20 minutes from casting the molds are stripped and the ingots placed in the soaking-pits, where they remain about 55 minutes, being then passed through the cogging mill and reduced to the required section, after which they are sheared to the specified weight and passed on to be reheated and rolled into plates. It may be said, therefore, that the slab is finished in 95 minutes—14 or 15 minutes for tapping and casting, 20 minutes in the molds, 55 minutes in soaking-pits and 5 minutes in cogging and shearing. The advantages of the new casting arrangements are very considerable. The whole operation is much more under control and is more methodically carried out; less plant is required in ladles, carriages, traveling cranes and molds; the cost in labor is much reduced; the shop is freed from *débris* and is cleaner and pleasanter to work in. The advantages of the other portions of the arrangements—the soaking-pits and cogging mill—are great in every way. The cost of labor is largely reduced; that of fuel is saved altogether; the loss of steel by reheating is reduced from, say, 2¾ per cent. to almost *nil*, our returns showing this loss in the soaking-pits to be only .02 per cent, and, in addition, the indidirect economies, by reason of improved quality of slabs, less defective plates, &c., are more important than you would credit if I were to venture to state them. Besides this, the comfort and orderliness with which the work can be done is largely increased, and is appreciated by the workmen themselves.

* Paper read by Mr. James Riley, of Glasgow, at the recent meeting of the British Iron and Steel Institute at Chester.

Countersink and Drill Combined.

This article, which is represented in the accompanying illustration, is made by the Wiley & Russell Manufacturing Company, Greenfield, Mass. As indicated in the name and the cut, this tool is for drilling and countersinking at the same time holes in carriage and wagon tires, sleigh runners, stoves for stove rods, and all kinds of metal work where a tool is required, as well as for starting wood screws in all kinds of wood. It is made of steel throughout, the cutting parts being made, we are informed, of the best English steel, and is so constructed as to be easily adjusted to make a deep or shallow hole or lengthen the cutter. The drill used is a straight-flued drill, the manufacturers making the point that such a one is less likely to break at the finish than any other kind. The cutter is made sufficiently long to enable it to be sharpened several times, and is easily taken out for that purpose. Concerning the operation of this tool, the manufacturers mention that, the countersink following the drill, the hole is finished at one operation, saving the adjusting of tools and work twice. They supply sizes



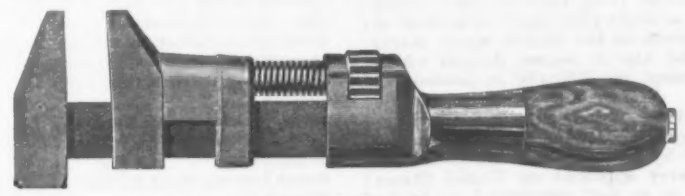
Lightning Countersink and Drill Combined.

with ½-inch shanks for drills ⅝-inch and under, and sizes with ⅝-inch shank for drills ⅞-inch and under.

HARDWARE NOVELTIES.

Improved Wrench.

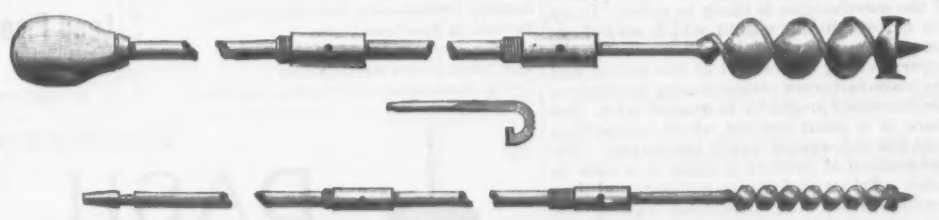
The illustration given herewith represents the Patent-Handle, Wrought-Bar Screw Wrench which has recently been put on the market by Geo. B. Curtiss, 95 Chambers street, New York. Its special features are readily seen from the cut, attention being directed to the large ferrule, and the fact that the screw-head is inclosed in the ferrule, thus giving it strong support. It is also pointed out that there is with this ferrule little or no liability to split handles and broken shanks. A minor improvement, but one which is claimed to add to convenience in use, is the manner in which the screw-head is formed, the deep and comparatively broad indentations facilitating, it is maintained, ease and rapidity of operation. These wrenches, which are described as made by improved machinery, and as case-hardened by the most approved process, are put on the market with claims of exceptional excellence. They are made in agricultural, mechanics' and engineers' patterns, of which the prices are given in the Trade Report.



Improved Wrench.

The Eureka Extension Holder.

This article, which is represented in the accompanying illustration, is made by P. Lowentraut, Newark, N. J., for whom John H. Graham & Co., 113 Chambers street, New York City, are agents. It is, as will readily be perceived, a contrivance for extending the shank of a bit, and is intended for the use of car-builders, millwrights, carpenters, plumbers, &c. It consists of sections 12 inches in length, each section being a steel rod, one end of which is square, resembling the shank of an ordinary bit, and the other end having a square socket which fits over the square shank of the bit which it is designed to lengthen. The outside of this socket is slightly raised, and threaded to receive the thimble, which is screwed to its place by a spanner or key, represented separately in the cut. In order to put the tool together the thimble is first placed over the shank of the bit, and a jointed ring which fits inside the thimble is placed on the shank against the square portion of the same. When the joint is made this ring serves the double purpose of preventing the bit from coming out and also centering it truly. The thimble is then screwed up by the spanner or key, making the joint complete. The other end of the section is made in the shape of the end of an auger bit, and by a similar operation is attached to the next joint. This process of attaching different sections can be repeated until the desired length is obtained. This holder is made of two sizes, Nos. 1 and 2. Size No. 1 will take any bit from ⅛ to ⅛ inches, and is made in two sections, each section being 12 inches long. Size No. 2 will take any bit from ⅛ to 2 inches and over, and is also made in two sections of 12 inches in length each. The cut of this larger size represents an attachment which, instead of being used with brace, as the smaller size is, is made to receive an auger handle, by which it may be operated.



The Eureka Extension Holder.

The Philadelphia Cable Roads.—The two large Corliss engines which are to run the underground cables on the Market Street Passenger Railway, from the ferries to Forty-second street, were successfully tested on Monday of last week. The engines are 300 horse-power each, and were built by Robert Wetherill & Co., of Chester. The new engine and machinery house is situated at Twentieth and Market streets. The six boilers, of 75 horse-power each, which supply steam to the engines, were also built by Wetherill & Co. In about six weeks the cable on the east division of the Market street line, from Twentieth street to the river, will be put down, the greater portion of the tunnel being now completed. There will be two sections of cable on Market street, both run by the engines at Twentieth street. The west section will run from Twentieth street to Forty-second street. Each of these cables will weigh 19,000 pounds. The first named will run at the rate of 7 miles an hour, and that to West Philadelphia at 10. Similar engines and machinery to those just completed at the Twentieth and Market streets station will at once be put in at the engine-house at Twenty-third street and Columbia avenue, to run the cable on the Columbia avenue line. Similar engines will also be placed in the new building on Sansom street, below Ninth, which will be erected by the Traction Company, which will run the cable on the Sansom street line.

A Heavy Judgment for Water Meters.—On the 7th inst. the New York Court of Appeals rendered a decision in the case of John Baird against the mayor, &c., of the City of New York, involving a judgment against the city for water meters to the amount of $1,500,000. In 1871, when Commissioner of Public Works, "Boss" Tweed, awarded a contract to José F. De Navarro for 10,000 water meters at $70 each, a competitive examination was held, and from the 40 entries Mr. Edward H. Tracy selected the Navarro meter and recommended its adoption to Mr. Tweed. It appears that the meters were furnished to the city, according to the contract, but for some reason they were never used, and the municipal authorities refused payment. After the disclosures of the rascalities of the Tweed ring there was a suspicion that this contract might have been one of the ring's jobs, and the claims of Mr. Navarro were stoutly resisted. The opinion of the Court of Appeals, written by Chief Judge Ruger, is concurred in by all the judges.

Railway Extensions in New South Wales.—The Government railway proposals recently submitted to the Legislative Assembly comprehend the construction of 1490 miles of railway, including extensions of 20 different lines transvering some very fertile parts of the colony. Light railways will be used where the nature of the country permits. The total estimated cost of the works is £14,000,000 to be raised in loans from time to time as required, the amount being propably spread over the next seven years. According to the official statement, the net return from the present railways is 4½ per cent on the capital invested.

Devices on American Coins.

The act of April 2, 1792, which established a mint in Philadelphia, then the seat of Government, provided that upon one side of the gold and silver coins of the United States there should be an impression emblematic of Liberty with an inscription of the word "Liberty" and the year of the coinage, and upon the reverse the figure or representation of an eagle, with the inscription "United States of America." The act of January, 1837, made similar provisions, and when the silver bill providing for the restoration of the "dollar of our daddies" was enacted it was provided that the same inscription should be placed on the standard dollar. The device on our coins emblematic of Liberty is no doubt devised from a similar device on the coins of the Roman Republic, anterior to Augustus, and has much of classic authority in its favor. Its adoption does not seem to have been determined by any specific act or instructions, and, in fact, the journals of the Senate and other proceedings of Congress show that the head of the President was at first intended as the device for one side of the coins. The first coins struck were cents, in 1793, on which the emblem was a female head, with hair flying wildly behind. In 1795 the cap of Liberty was introduced, supported on a wand projecting behind the head. In 1796 or 1797 the cap was discarded. The first silver coins were struck in 1794. The head of Liberty, with flowing hair and without the cap, formed the obverse. This style was retained, with slight modifications, until about the year 1808, when a more pleasing head of Liberty, with hair dressed and cap, was adopted. The device was taken from life, and was considered a model in good taste of the fashion of the time. The inscription of the word "Liberty" was at the time transferred from the margin of the coin to the band of the cap.

The first gold coins struck in 1795 were ornamented with a head of Liberty and a cap head-dress, corresponding with the fashionable head-dress of that period. This continued until 1807, when the head-dress on the gold coins was made to conform to that on the silver. Upon the change of standard in 1834 the Liberty cap of the goddess was removed from the head, and the hair confined by a band inscribed with the word "Liberty." The next change took place near the end of the year 1838, the hair being looped up behind and entwined with braids, a couple of stray curls hanging loosely upon the neck, and the front of the head embellished with a tiara inscribed "Liberty." Since then the changes in the artistic devices and designs upon coins have been few and unimportant. The reverse of all our larger coins has always presented to a certain extent the heraldic elements forming the arms of the Union, and no doubt in accordance with the almost universal usage of the independent sovereignties, of presenting a device on the reverse of their coinage bearing heraldic allusions more or less elaborate, to the arms of the Government or sovereign authority. In the various changes made from time to time, every effort has no doubt been made to present as beautiful coins as the limited space would permit, and also to secure designs which would present no difficulty in mechanical execution. The head of "Liberty" on the standard dollar, designed by a young English engraver, is chaste and beautiful, and is considered by artists the best executed head that has ever appeared on United States coins. It is so well distributed as to be susceptible of easy work under the die, and, like its predecessor of 1808, was taken from from life.

Cutting Prices on Machinery.

Complaint is made by manufacturers of special machinery, says the *American Miller*, that cutting of prices has demoralized the market, and there is no money, or next to none, in the business, unless the manufacturer is able to sell on long time; on cash sales profits have almost entirely disappeared. While this alleged cutting is, like the ague, in the next county, and the teller of the tale is doing little or none of it himself, there is no doubt that some lines of machinery were never sold so cheap as they have been the last few months. The reason is obvious. The times are depressed, and the manufacturer of mill machinery wishes to maintain the volume of his business, even at the sacrifice of a share of his profits, just as the miller not infrequently slaughters his flour to keep his mill-wheels going.

Of course millers, in a certain sense, reap the advantage of such a state of the machinery market, and for those who have money the present is undoubtedly a good time to make needed improvements. But we doubt if any one is permanently benefited by a long-continued war on prices. The quality of the merchandise is likely to suffer. There are certain limits within which we believe competition is beneficial to all concerned, the buyers getting the benefit of low prices, and the manufacturers compensating themselves for decreased profits by increased sales. But there is a point beyond which competition does not and cannot profit the buyer. The competition of grocers in sugar is a case in point. Prices go down to nothing, and then—adulteration. So continued cutting of prices in machinery is likely in the end to result in the market being stocked with inferior machines. The prices of some classes of mill machinery have in the past been unreasonably high, but this cannot be charged now, we think, on any class of mill machinery that is offered the miller. Machinery is cheap; perhaps not too cheap, but quite cheap enough.

The Telephone on the Continent.—The use of the telephone is generally on the increase in most parts of the Continent, the subscription in France being at the rate of 200 francs ($40) per annum, reduced to 170 francs ($34) when there are over 300 subscribers. The manufacturing towns of Lille, Roubaix and Turcoing are now in communication, the average number of messages per day between the two latter places being 657, and the system is in force also at St. Quentin and Troyes. Rheims is the best served town in France for its size, and contains 210 subscribers, or 23 out of every 10,000 inhabitants. This is the highest number, comparatively, in the whole country, Paris, Lyons and Bordeaux having but 14 to every 10,000; Calais and St. Pierre, 22; Havre, 18. The total number of French telephone subscribers is 5535, while Germany has only 4000 in 21 cities and towns. The proportion at Berlin is 9 to the 10,000 inhabitants; Vienna, 4, and Brussels, 11. Munich has 393 subscribers; Leipzic, 285, and Chemnitz, 101. A system has just been inaugurated at Mons, in Belgium, so that the inhabitants of the coal district of the Borinage can converse with Brussels, Antwerp, Charleroi, Liège and Vierviers.

For a powerful magnet Sig. B. Ricco, of Palermo, rolls a long band of sheet iron around a nucleus of soft iron, insulating the different layers of the band by oiled paper. One pole is connected with the nucleus, to which the interior extremity of the band is soldered, and the other is connected with its exterior extremity. The current, in traversing the band, magnetizes not only the nucleus, but also each layer of the band, which thus is both conductor and magnetic substance, thereby condensing the lines of force, and producing a great concentration of power.

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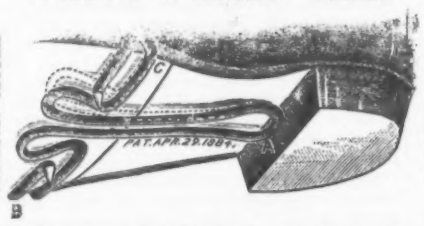

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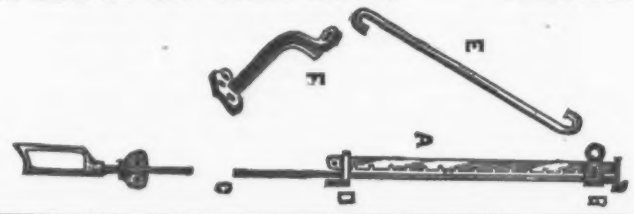

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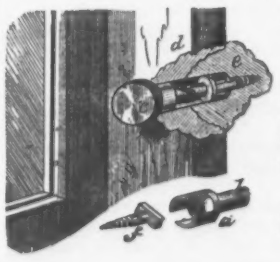

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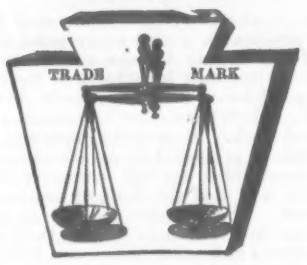

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To all persons interested in healthy homes, whether they are planning new houses or altering old ones, this volume will commend itself. Books of this class should also be in the hands of every professional builder, and plumbers especially will find contained in these pages not only the practical information required for the details of their trade, but also much that they should know to make them competent in their work, and to prevent them from making the too frequent careless or stupid mistakes which result from bungling work. The book is divided into twelve chapters, the headings of which are as follows: Fresh Air versus Sewer Gas; Necessity of Ventilation in Rooms Containing Modern Conveniences; Defective Arrangement of Plumbing Fixtures; Soil and Waste Pipes as Usually Found in Dwellings; Traps and Systems of Trapping; Details of Traps; Insecurity of the Common Water-Seal Traps; Defects in the Plumbing Work of Dwellings; Cellar Drains and Drainage of Cellars; Usual Defects of House Drains; Sewer Connections, Privy Vaults and Cesspools; System of Internal Sewerage as it should be in a Dwelling; Plumbing Fixtures; Removal and Disposal of Household Wastes. The chapter on Plumbing Fixtures is very complete, and the numerous illustrations add greatly to the value of the book.

Scott.—Irrigation and Water Supply. By John Scott. 34 illustrations, 149 pages, 12mo, cloth; London (Weale's series), $0.60

Farmers and stock raisers, as well as householders, living at a distance from cities, will be interested in and will derive much profit from this book. The various methods of irrigating land, of obtaining water by artificial means and of storing it for use, the construction of wells and reservoirs, and the raising of water by mechanical means, are the subjects that are discussed. A simple description of the construction and action of the improved hydraulic ram for supply water to country houses is alone worth the price of the book.

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On the Manufacture of Crucible Cast Steel.*

The old-fashioned method of converting bar iron into steel and afterward melting it in clay pots to form ingots of cast steel, which are reheated and rolled or hammered to the size and shape required, has been so frequently described that I should not have ventured to bring the subject before the notice of the members of the Iron and Steel Institute had I not been requested to do so by the council of the society. It was suggested that, inasmuch as the *Journal* of the Institute did not contain a paper on this subject, the occasion of the annual meeting of the members being held in the town of Sheffield, the headquarters of the crucible cast-steel trade, would present an appropriate opportunity for collecting the facts connected with such an important branch of industry.

These facts may perhaps be all the more interesting now that Sheffield has somewhat ungraciously failed to respond to the wishes of the Institute; not in the least degree from want of hospitality, but from a deeply-seated belief that the patent laws are so bad that it is more profitable to keep secret a mechanical improvement than to patent it. Sheffield inventors have learnt by bitter experience that secrecy is the only protection for improvements; and if they think that they have found a goose that is going to lay golden eggs, they lock and double-lock the fowl-house door. It is said that there is no act of Parliament through which you cannot drive a coach-and-four, and I am afraid that the patent laws are no exception to the rule, if you only have sufficient money to buy a strong enough team. I may premise that I have nothing new to bring forward. No Sheffield firm has yet succeeded in discovering the philosopher's stone. We all have our little secrets, which we jealously guard (and they have no greater scientific value than the secrets of the Masonic fraternity), but in spite of the important and valuable discoveries which have been perfected during the last quarter of a century in the methods of producing cast steel, the old-fashioned crucible-steel manufacturers of Sheffield still hold their own. They still convert bar iron into blister steel and melt blister steel into cast steel, and some of them have not been altogether unsuccessful in transmuting cast steel into gold.

The accumulated experience of a century has convinced the manufacturers of crucible cast steel that the finest qualities can only be made from bar steel which has been converted from iron manufactured from Dannemora ore. This iron is expensive; its average cost for the last 40 years has been at least £25 a ton: the process of converting it into steel is slow and costly; the process of melting in small crucibles is extravagant both in labor and fuel, and consequently the best qualities of crucible cast steel can only be sold at a high price. So-called best crucible cast steel is sold at low prices by unscrupulous manufacturers and bought by credulous consumers, but, though it is quite possible for high-priced steel to be bad, it is absolutely impossible that low-priced steel can be good. The finest quality of steel cannot be made of cheap material or by a cheap process. Every year the attempt is made, and every year it signally fails. No one ever made a better try than Sir Henry Bessemer, but his failure was as complete as that of his predecessors. He attempted to produce an article at £6 a ton to compete with one at £60 a ton, and failed absolutely. It is true that his steel is a success, perhaps the most brilliant success of the century. I am not quite sure that he himself believes in his failure. In his lecture before the Cutler's Company of London, in 1880, he chaffed the steel manufacturers of Sheffield on their antiquated attachment to the rule of thumb, and twitted them with the assertion that the high price of crucible cast steel arose from a combination of trade interest on their part and of prejudice on the part of their customers. Sir Henry Bessemer may have half ruined the wrought-iron trade, and revolutionized the pig-iron trade, but the crucible cast-steel trade holds its own in spite of his great discoveries. When railways were first introduced, and wagons and coaches were to a large extent driven off the road, many people thought that the price of horses would permanently fall, but exactly the contrary took place. Similar fears were entertained that the demand for crucible cast steel would seriously decline when the Bessemer and Siemens steel came into the market. This has not been the case. The commoner qualities of crucible cast steel have been to a large extent superseded by Bessemer and Siemens steel, but the enormous quantities made by the latter processes have required for their manipulation, directly or indirectly, such a large quantity of the better qualities of crucible cast steel that the total amount of the latter now produced in various parts of the world is probably double that which was required before the birth of its rivals.

Chemical analysis plays a very important part in the manufacture of iron, Bessemer and Siemens steel, and even of the comparatively small quantity of crucible cast steel which is still used for purposes in connection with which it is not required to be hardened and tempered. It is possible to judge very accurately of the quality of those metals from their chemical analysis, almost as much so as from the results of mechanical tests, such as the breaking strain and the contraction of the area of fracture. But in what we may call, for want of a better name, the legitimate cast-steel trade, chemical analysis, though it tells us a great deal, does not tell us everything. The analysis of steel shows the amount of other ingredients which it contains besides the nine-tenths or more of iron which forms its basis. The amount of carbon, silicon, manganese, sulphur, phosphorus, copper, &c., may be ascertained with tolerable accuracy, and the information thus obtained is often of the utmost importance, but it is quite possible to make a comparatively low-priced steel which shall show precisely the same chemical analysis as the best crucible cast steel; nevertheless, it is found by practical experience to be inferior in quality. That this is a fact has been proved over and over again beyond all possibility of doubt. It is a sufficient reason why Sheffield manufacturers have been willing to pay such a high price for Dannemora iron for so many years, but it is not a sufficient reason why so many Sheffield manufacturers should ignore the results of chemical analysis altogether. Of every fact there must be some explanation, though we may, for the present at least, be ignorant of it. To say, with the Sheffield devotees of the rule of thumb, that one steel possesses "body," and that the other does not, explains nothing, but merely adds to the synonymy of the subject by altering the nomenclature. If the metallurgical chemists could once convince themselves that this difference in quality is a fact, they would probably soon be able to give us an explanation. We already know much of the chemistry of steel, and what remains to be learned is as certain to be some day discovered as the fact that Newton discovered the laws of gravitation. Mathematicians may never discover how to square the circle; mechanics will never discover a perpetual motion, nor will chemists ever discover the transmutation of metals, but the discovery of the chemical explanation of "body" is only a question of time. By way of stimulating inquiry, I venture to suggest two possible causes of body which may be worth consideration as a tentative hypothesis of its nature. The best razor steel contains 1½ per cent. of carbon. It must be melted from evenly-converted steel. It will not do to mix hard and soft steel together, or to melt it from pig "let down" with iron, though in either case the exact 1½ per cent. of carbon may be the result. Steel made by the latter processes will not possess the requisite amount of body; consequently, the cutting edge of the razor will not stand. It must be melted from steel converted from iron made from ore containing manganese. It will not do to add the manganese in the form of spiegeleisen or ferromanganese. Carbon and manganese exist in combination with iron, not chemically combined in certain definite proportions, but as alloys, as mechanical mixtures in any proportion. We know that carbon exists in combination with iron in two forms, either as combined carbon or free carbon; is not possible that manganese may also exist in two forms? and though the razor steel must have been boiled in the pot for half an hour after it was melted, to kill it and make the ingot pipe, is it not possible that the mechanical mixture of the carbon and manganese is less homogeneous in steel made by the cheap processes than it is by that made by the old-fashioned method? It has been stated that the finest qualities of steel when hardened show a more perfect regularity in their crystallization when examined under a microscope than commoner qualities, and I venture to suggest that a possible explanation of "body" in steel may be absence of injurious ingredients, combined with the perfectly homogeneous presence of the advantageous ingredients. Hardened steel is crystallized steel; and perfect regularity of crystallization in steel which is required to be ground to a fine cutting edge may be a necessity which can only be secured by the slow and expensive old-fashioned method.

The principal reason why Bessemer and Siemens steels have failed so completely to supersede crucible cast steel for purposes where the better qualities are required is that they cannot be made sound without the addition of silicon or manganese. In melting common steel (containing, for example, from .15 to .05 per cent of phosphorus), the steel must be poured into the mold as soon after it has become perfectly fluid as possible, and as hot as the tensile strength of the pot will allow. In making the higher qualities of crucible cast steel (where the percentage of phosphorus ranges from .01 to .001) a similar mode of treatment would produce very strange results; the molten steel would boil over in the mold, the fracture of the ingot when cold would show a series of bubbles like a sponge, and its specific gravity would scarcely exceed that of wood. Some of these bubbles or honeycombs would weld up when the ingot came to be forged, but by far the greater number would be coated with an oxide which would make a weld impossible, and the bar, if it was not burnt up in the fire, would be so full of the imperfections, technically called "seams" or "roaks," as to be perfectly useless. To obviate this disastrous result it is necessary to boil the steel for nearly half an hour after it has become fluid, and then to allow it to cool down to a certain temperature before it is poured into the mold. This process is called, in the language of the votaries of the rule of thumb, "killing" the steel, and it is an axiom among them that the higher the quality of the steel the more "killing" it takes. It is in this part of the process of crucible cast-steel melting that its special virtue consists, and the cost and quality of the cast steel produced depend in a large degree upon the skill brought to bear upon it. There is an old proverb in Sheffield, usually expressed in the terse vernacular of the country, but which may be refined into the expression that if you put his Satanic majesty into the crucible his Satanic majesty will come out of the crucible. The converse of this is by no means the case. Though you may convert iron into steel in the crucible, you cannot convert bad steel into good steel in the crucible; but though you may put the most angelically pure steel into the pot, you may by bad management, by not "killing" it properly, pervert it into Satanically bad ingots. Now this "killing" of the steel is precisely what cannot be done in the Bessemer or Siemens processes without the addition of such a large amount of manganese or silicon that the steel becomes brittle when hardened.

I do not know whether chemists are agreed on an explanation of the necessity for "killing" high-class steel. When iron is made into steel in a converting furnace, it is assumed that the oxygen in the air in the converting pot unites with the charcoal, and is soon made into carbonic oxide, which is occluded by the white-hot iron, and forced by it to part with as much carbon as is sufficient to reduce it to carbonic acid. It has been ascertained that metals have the power of absorbing or occluding many times their own bulk of gas, and possibly the carbonic oxide, when it has parted with the amount of carbon necessary to reduce it to carbonic acid, is not then expelled from the iron, but may remain in an occluded state, and requires to be expelled in the melting pot by boiling. Be this as it may, it is a fact that if it be required to make blister steel harder than about 1.4 per cent. of carbon, it is necessary to convert it twice over, possibly in order that in the interval it may part with some of its occluded carbonic acid, so as to make room for a further occlusion of carbonic oxide.

Another fact which may throw some light upon this question is that blister steel melted directly after being drawn from the converting furnace requires more "killing" than that which has been exposed to the air for some time, during which it has presumably had an opportunity of parting with some of its occluded gas. The addition of a portion of scrap steel materially assists the process of "killing," as would naturally be the case if we suppose that the scrap (which has been melted before) has parted with its occluded gas in the first melting. The fact that the presence of manganese or silicon helps largely to kill the steel may possibly be accounted for on the theory that the carbonic acid unites with the manganese or silicon and becomes a solid, or it may be that in an alloy of iron with either manganese, silicon or phosphorus the occluded gas is expelled at a much higher temperature than in pure iron.

Before describing the process of making crucible cast steel it may be useful to devote a few words to the nomenclature of iron and steel. This is almost as much a vexed question as that of zoölogical nomenclature, and might form the subject of a code of laws which would probably be as complete a failure as those issued under the auspices of the British Association for the Advancement of Science, which have made confusion in the scientific names of birds and beasts worse confounded. In Sheffield we attempt to discriminate between iron and steel, which we regard as generally distinct, and each of which we subdivide specifically, though it must be admitted that neither our generic nor specific names are very scientific.

Pig iron is melted direct from the ore in a blast furnace, and contains from 3 to 5 per cent. of carbon. When remelted it is called "cast iron" or "metal."

Spiegel iron is precisely the same, but contains in addition from 5 to 15 per cent. of manganese.

Bar iron, often called wrought iron, is pig iron which has been smelted and deprived of nearly all of its carbon, either in a puddling furnace or by the Walloon, Lancashire or other analogous processes; the spongy mass or ball of iron is usually hammered or rolled into a bar, which for the Sheffield trade is generally 3 inches wide, ⅝ inch thick, and from 6 to 12 feet long.

Puddled steel is precisely the same as "bar iron," except that the process of puddling is stopped when rather more than half of the carbon has been removed from the pig iron. There is, consequently, no hard and fast line between bar iron and puddled steel, the one intergrading to the other by imperceptible degrees. Although there are an infinite number of intermediate stages between the softest bar iron and the hardest puddled steel, and although it is impossible to state the exact percentage of carbon which marks the dividing line between one and the other, it is usual to call all puddled bars which cannot be hardened in water bar iron, and all those which can puddle steel. This dividing line falls somewhere near a mixture containing ½ per cent. of carbon, and although it looks very vague and unscientific to use two terms which thus intergrade, no confusion of any kind or misunderstanding has ever been known to arise from their use.

Blister steel is bar iron which has been converted into steel in a converting furnace, and varies in the amount of carbon which it contains—from ½ to 1½ per cent. There are, of course, an infinite number of degrees of carbonization between "hard heats" and "mild heats," but for the convenience of the trade six of them have been selected, and have received names as follows:

No. 1. Spring heat.....	¼	per cent. of carbon.
No. 2. Country heat	½	" "
No. 3. Single-shear heat..	¾	" "
No. 4. Double-shear heat.	1	" "
No. 5. Steel-through heat.	1¼	" "
No. 6. Melting heat.....	1½	" "

Bar steel is blister steel which has been tilted or rolled down to the size required.

Single-shear steel is produced by welding half-a-dozen bars of blister steel together. Only those bars are chosen in which the process of conversion has been so far carried on that the outside of the bar is steel and the center of the bar iron. When these are welded together, and tilted or rolled down to a small dimension, the result produced is a mechanical mixture of iron and steel, a material which combines great tenacity with the capability of carrying a moderately hard-cutting edge, and is much employed for certain kinds of knives.

Double-shear steel is produced by drawing down single-shear to suitable-sized bars, and rewelding two of them together, so that the mixture of iron and steel may be more perfect.

Cast steel is steel that has been melted in a "pot" (called a crucible in the encyclopedias), and poured in a "mold" (called a "form" in the learned books), thus becoming an "ingot," which is afterward hammered or rolled to the size required. It may be made of various "tempers," varying in the percentage of carbon which they contain—from ¾ or less to 1½ or more. The different tempers may be arrived at in various ways. For the great majority of purposes there can be no doubt that the best way is to put into the melting pot broken pieces of blister steel converted exactly to the temper required; and the more evenly the steel is converted, and the more carefully all bars which are harder or softer than the temper required, or which are "flushed" or "aired," are rejected, the better. Blister steel, when carefully "taken up" or selected, will produce a cast steel which combines the greatest amount of hardness with the maximum amount of elasticity when hardened. It may, however, happen that for certain purposes "soundness" in the bar, the result of absence of "honeycombs" in the ingot, may be the most important quality required in the steel; for others, the property of welding most perfectly may be the *sine qua non*; or the great evil to be avoided may be the tendency to water-crack in hardening; or the steel may be used for some purpose where it does not require to be hardened, and the object to be secured is the combination of the greatest amount of hardness and toughness when unhardened. In all cases the mode of manufacture must be adapted to the objects which it is most important to secure. In addition to the mode of operations already mentioned, there are two other ways in which the same percentage of carbon may be secured. You may either put cut bar iron into the pot and "fetch it up" to the required temper with charcoal, or you may put broken pig iron into the pot and "let it down" to the required temper with cut bar iron. A fourth *modus operandi*, which for most purposes is the best of all, might be enumerated, namely, the selection of blister steel slightly harder than the temper required, so as to admit of being slightly let down to the exact temper by the addition of a small quantity of somewhat milder cast-steel scrap.

Bessemer steel and Siemens steel do not require definition, nor do they come within the scope of this paper.

The process of converting—or, as it is generally called in the encyclopedias, the process of cementing—iron into steel is carried on in a converting furnace. This furnace consists of two stone troughs, technically called "converting pots," each of them about 4 feet wide, 4 feet deep and 12 feet long, and placed side by side, with a fire underneath them, the flues of which conduct the heat all round each pot. These troughs or pots are built up of slabs of a peculiar kind of fire-stone, obtained in the neighborhood of Sheffield, and possessing the property of not cracking if heated slowly to a high heat and allowed to cool slowly. The slabs are united together with a mortar made of ground fire-clay. Over the two pots is built a vault of fire-brick, and the whole is inclosed in a dome of red brick, to prevent, as much as possible, the heat from escaping. At the bottom of each pot is placed a layer of charcoal, broken up into small pieces, from ¼ to ½ inch square. On this a layer of bars of iron is placed, which is covered with charcoal; another row of bars of iron follows, and so on until the pot is filled with alternate layers of charcoal and iron; it is then carefully closed with a thick cover of "wheel-swarf," a silicious species of mud, which accumulates at the troughs of the Sheffield grinding-wheels, and is, of course, the material of the grindstone worn away in the process of grinding, and mixed with the finest steel dust which has been ground away, a substance which will resist long exposure to great heat, and renders the top of the pot practically air-tight. In order to test the progress of conversion, and to ascertain the precise moment when the fire should be allowed to go out, two or three bars of iron are allowed to protrude through a hole in one of the pots made for the purpose. These bars, technically called "tap bars," are drawn and inspected at or near the close of the process, and are tightly packed in white ashes where they pass through the end of the converting pot, so that no air may find its way to the charcoal inside.

The converting pots, full of alternate layers of iron and charcoal, and for all practical purposes hermetically sealed, are gradually raised to nearly a white heat, and kept at about that temperature for a week or more, according to the amount of carbonization required. Another week is occupied in the process of cooling, which must be done slowly, in order to prevent the pots from cracking, after which the cover is broken up and removed, and the bars, which went into the furnace bars of iron, are taken out of it bars of "blister steel," so called from the bubbles or blisters which have arisen on the surface during the process of conversion. Some of the charcoal has been consumed during the week at which it was white hot, but a considerable portion of it remains, and is taken out of the furnace as black as it went in.

A chemical change in the composition of the bars has taken place. They were originally pure iron, or nearly so, containing perhaps ¼ per cent. of carbon or less, were fibrous in their structure, and would bend double without breaking. After the process of conversion they have become a carburet or carbide of iron or steel, containing from ½ to 1½ per cent. of carbon, according to the length of time they have been in the furnace and the degree of heat to which they have been subjected. They are now more or less crystalline in their structure, and can be broken by a slight blow of a hammer. The converting furnaces in use in Sheffield vary in size, some holding as much as 30 tons of iron, and others not more than 15 tons. The iron gains slightly in weight by being converted into steel. The process occupies about three weeks, and a pair of pots may be used from 20 to 40 times before they are worn out and have to be replaced by new ones.

As in every other process connected with the manufacture of steel, in the process of conversion it has to run the gauntlet of many perils. Sometimes the pots crack; air is admitted to the furnace; the charcoal is burnt, and in bad cases even the iron is oxidized. Bars which have thus missed conversion are technically said to be "aired;" and even when very slightly affected may easily be discovered, in consequence of their having almost lost the tendency to become rusty. If the furnace be raised to too high a heat the surface of the bars will melt, and when they are drawn it will appear "glazed." There are even instances handed down by tradition in Sheffield of unskilled converters, who had heated the furnace under their care to such a degree that the whole mass of iron and charcoal had become fused together, and the end of the furnace had to be taken out to remove the contents. During the process of conversion the outside of the bar of iron is turned into steel the first, and in a spring heat the center of the bar remains iron, though when the bar is broken the crystals of iron have lost their brilliancy; in technical language, the bar is said to be full of "sap," though the sap is "killed" and no longer looks "raw" or "stares." In a country heat the sap is still more killed, and the crystals of steel on the edges have become more distinct.

In a single-shear heat the fracture shows more steel on the outside and less iron in the center, until in a double-shear heat the fracture shows about equal proportions of iron and steel. It is important that the transition from one to the other should be as gradual as possible. When the line of demarcation is violent or sudden, the process of conversion has been carried on too rapidly, and bars of blister steel so converted are said to be "flushed." In a steel-through heat, as its name implies, all trace of iron in the fracture has been lost sight of, but the crystals of steel are small. A short time longer in the furnace will make the steel a melting heat; the crystals will be large, and in exceptional cases their facets will reach across the bar.

The melting furnace consists of a row of oval melting holes large enough to contain two melting pots, one in front of the other, and deep enough to allow of sufficient coke to cover the lids. From each melting hole a flue leads in old-fashioned furnaces into a flat stack, each hole having a separate flue in the stack; but many furnaces are now made with short flues from each hole leading into a main flue which ends in a single square chimney. The application of gas to the melting of steel has been successful, but for the highest qualities coke is principally used, as the control which the melter has over the temperature of each pot, which sometimes requires "keeping back" and sometimes "hurrying on," is supposed to be more absolute. There can be little doubt, however, that the adoption of gas melting furnaces is only a question of time. The furnace floor is on a level with the top of the melting holes; and the grate bars, as well as a flue leading into the chimney by which the draft may be controlled, are accessible from the cellar. The pots in which the steel is melted are generally made in a room adjoining the melting furnace. They are composed of a mixture of Burton and Stannington clay, to which is sometimes added a proportion of Stourbridge clay, and, if the pots are required to stand a great heat, of china clay from Devonshire. A small quantity of ground coke as well as of old pots ground is also added. Great care is taken that the clay be absolutely disintregated and perfectly mixed together. This is accomplished by treading it in a trough, the pot-maker and his assistant kneading it with their bare feet. The pots are molded in an iron "flask" by means of a wooden "plug," and are slowly dried at the the back of the stack, and the night before they are used gradually heated to a dull-red heat, a process called annealing. Pot-making is a very important part of the manufacture of best cast steel. It is absolutely impossible to make good cast steel if the pots are defective. Each pot lasts a single day, and is used three times, containing severally about 50, 44 and 38 pounds of steel each round. The object of lessening the weight of each successive charge is to bring the surface of the molten metal to a different place in the pot, because the "flux" or scum which accumulates on the surface has a chemical action on the silica of the pot, which is, consequently, decomposed for some depth just at that point, and the pot is reduced in thickness.

The bar steel is first carefully selected of the exact temper required, all flushed or aired bars are ejected, and after it has been broken up into small pieces and carefully weighed, it is conveyed to the pot, which has already been placed in the melting hole through an iron funnel called a charger. The lid is carefully adjusted, and the melting hole filled with coke. The degree of heat to which the furnace is allowed to go is carefully regulated by the "puller-out," who is technically said to "work" the holes, and who has perfect control over them by means of the two flues, into either end of which he can insert a fire-brick if required; a brick in the melting-hole flue lessens the heat by lessening the draft; one in the cellar flue increases the heat by increasing the draft. The head melter periodically inspects the pots, and gives the final instructions to the "puller-out," and decides the precise moment when the steel is dead melted, and the holes sufficiently burnt down to allow of its being "teemed" or poured into the mold with a fair chance of producing a sound ingot. When the "puller-out" has put on his "clothes," by which is meant a series of sacking wraps which envelop the arms and legs, and are soaked with water to protect him from the heat, he raises the pot with a pair of "pulling-out tongs," and lifts it from the hole to the floor of the furnace. The lid is instantly taken off with a pair of lid tongs, and the scum or flux is removed by a skimmer from the surface of the molten steel, which is then poured into a cast-iron mold formed of two halves tightly ringed and wedged together. The interior of the mold has been previously "reeked" or covered with a coat of coal-tar soot to prevent the ingot from adhering to it.

(To be continued.)

*Read by Mr. Henry Seebohm at the Chester meeting of the British Iron and Steel Institute.

Cobalt Bronze.—A new alloy known as cobalt bronze has been recently introduced in England by Messrs Henry Wiggin & Son, of Birmingham, the same firm that some time ago brought out the alloy silveroid. It is, says an English contemporary, perhaps, the more interesting of the two, because there is introduced into its composition small quantities of the metal cobalt. The malleability of cobalt in a pure metallic form has long been understood, but we believe it was not until a few years ago that it was demonstrated by Messrs. Wiggin that it might be rolled into sheets and wrought like other metals into articles of utility. Its high price, however, interfered with its production and militated against its use. This fact induced Messrs. Wiggin to endeavor to compound an alloy in which the sterling qualities of this valuable metal could be fully represented, and which, at little more than the cost of ordinary German silver, might possess in a large degree all the attributes of the pure metal itself. Possessing, as it is said to do, many of the qualities and every appearance of metallic cobalt, it is manufactured in several qualities, the higher grades being preferable on account of their suitability for casting purposes, their close, steel-like surface, their susceptibility of a high polish, as well as their hardness, toughness and great tensile strength.

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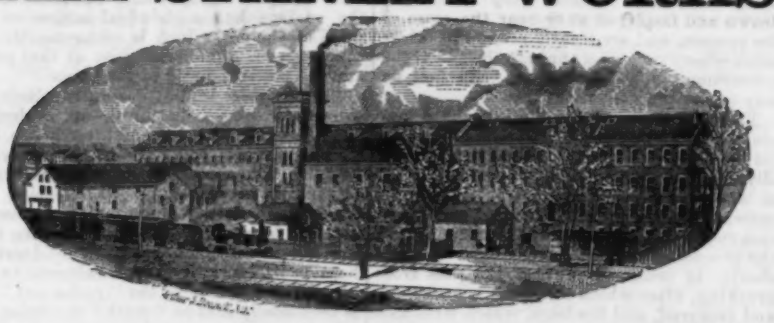

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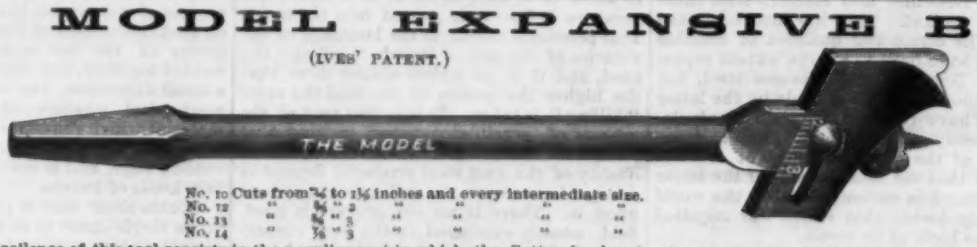

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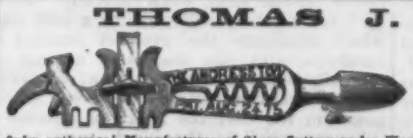

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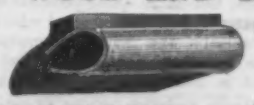

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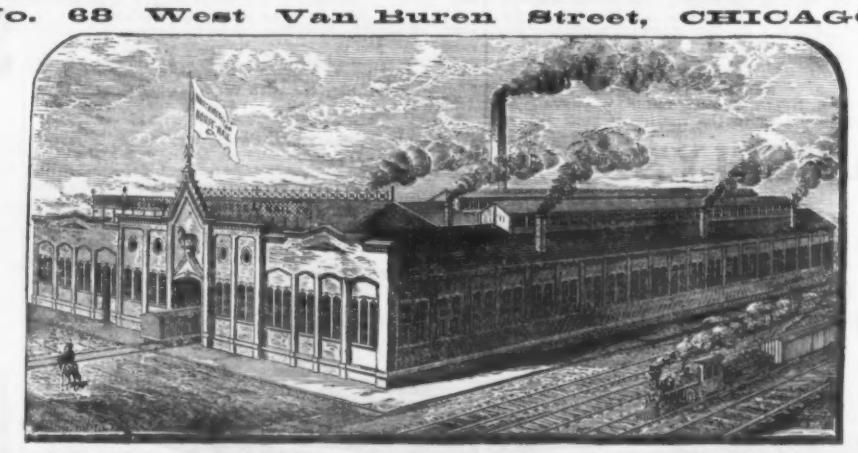

IN QUALITY, uniformity of shape and style, they are unequaled.

They are the safest nail to drive.

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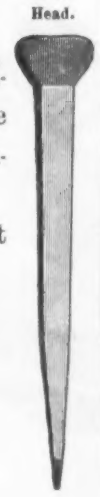

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Yours respectfully, O. D. CHARLES.

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MR. THAD. A. NEELY, Muncie, Ind.: We have great pleasure in testifying to the merits of your MUNCIE ROLLER SKATE We have had ten years' experience in Roller Skating in many different countries, during which time we have seen and tested a hundred or more different patents. We have had your Skate in daily use now over two months, and have therefore given it a GOOD, FAIR TRIAL, and can HONESTLY ASSERT it to be superior to any we have used before. We are, dear sir, yours faithfully, LANE BROS., (English Professionals of London), English Roller Skaters, with W. W. Cole's Circus, U. S. America.

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THAD. A. NEELY, Muncie, Ind: We have been using your MUNCIE ROLLER SKATE for the last three months, and have pleasure in stating that we consider it superior to any that we have previously seen or used, and we shall always recommend it as such.

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(Fletchers' Trio of Skaters.)
Russian Roller Skaters, with W. W. Cole's Circus.

The above cut shows our Scientific Club Skate with heel strap and toe clamp. This clamp adjusts to any size without the use of a wrench or screw driver. For elegance of design, lightness, neatness, strength and durability, it has no equal. The foot rest is constructed of malleable toe and heel, with best Spring Steel Shank formed to fit the foot perfectly. Best Steel Axles with shouldered washers and screw linch pin; the axle has a shoulder cut on the end to correspond with the washers; when the screw is turned in it holds the washer firmly to the shoulder, keeping the washer from turning, and making the strongest and neatest wheel fastening yet devised for a Roller Skate. It cannot tear your clothes in skating, or your hands in cleaning the wheels, as in others. They adjust to three different sizes in the large size Skate, and two sizes in the smaller Skates. A trial is all that is necessary to prove their superiority over all others. We guarantee this Skate to describe a circle 16 inches in diameter.

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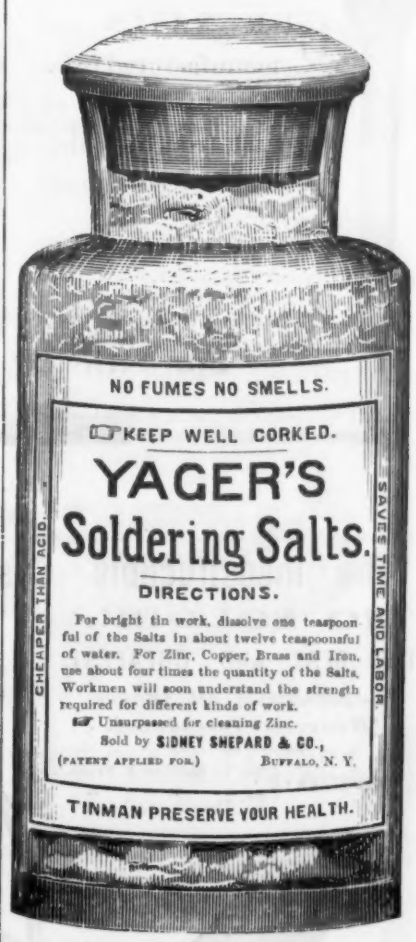
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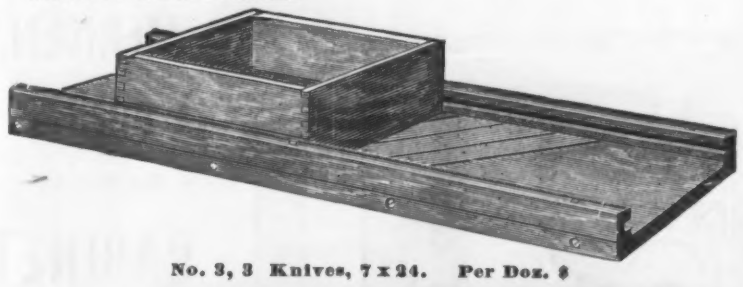

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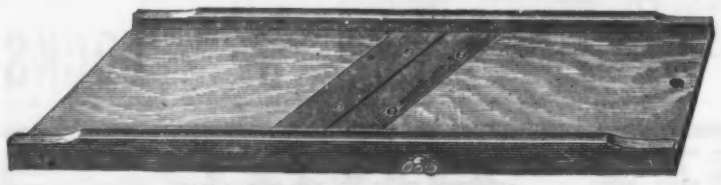

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2 knives, " ..... $

KRAUT CUTTERS.

No. 1,	1 knife,	with box	8x26,	per doz.
" 2,	2 knives,	"	"	"
" 3,	3	"	"	"
" 4,	4	"	"	"
" 5,	3	"	9x30,	"
" 6,	2	"	12x36,	each.
" 7,	3	"	"	"
" 8,	4	"	"	"
" 9,	3	"	12x40,	"
" 10,	4	"	"	"

Our Kraut and Slaw Cutters are made from well-seasoned cherry, and fully guaranteed to be first-class goods in every respect.

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MANUFACTURERS OF

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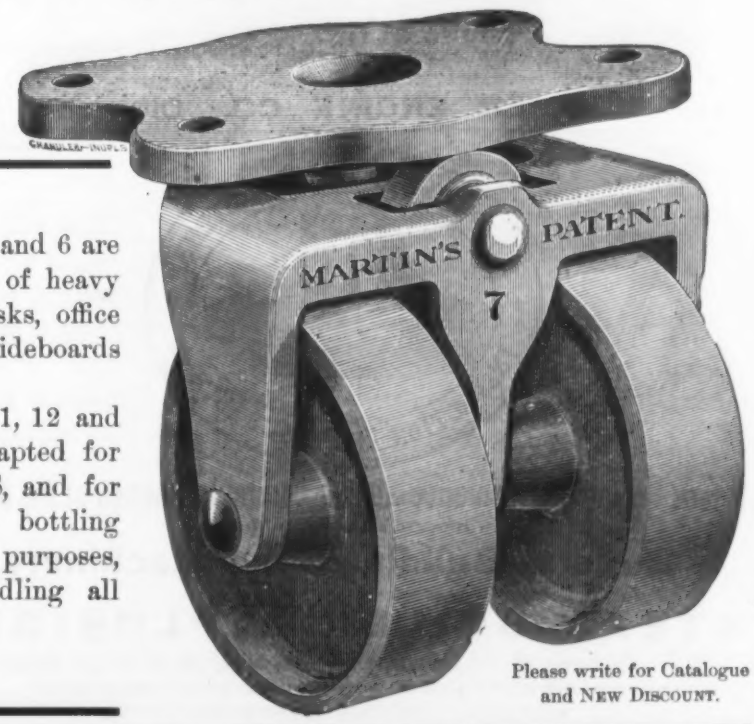

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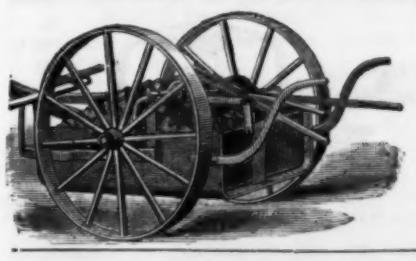

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Has great advantages over all others. It has

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Good on long or short hauls. Three sizes: 9, 13 and 16 cubic feet.

HASLUP'S ALL-STEEL DRAG SCRAPERS

Beat all others for capacity, durability, strength, light draft. Being ALL STEEL (except wood handles), are lighter, stronger and better made than any other. 3 sizes. Also, Township and Railroad Plows.

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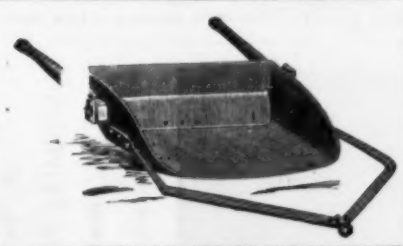

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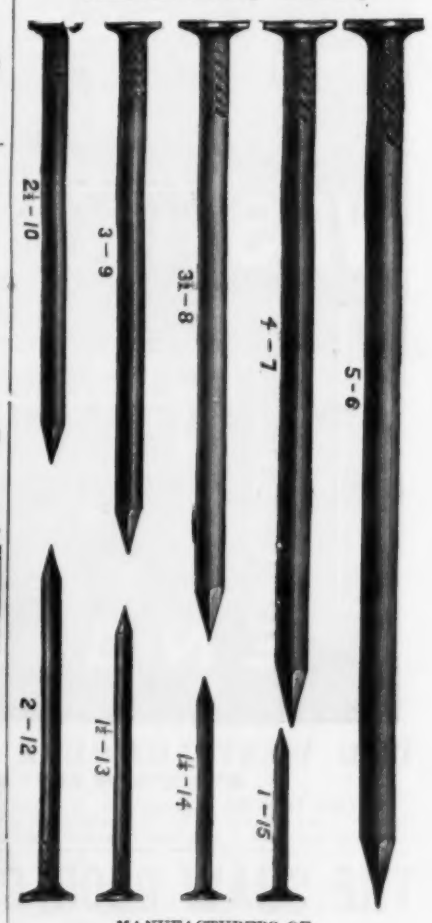

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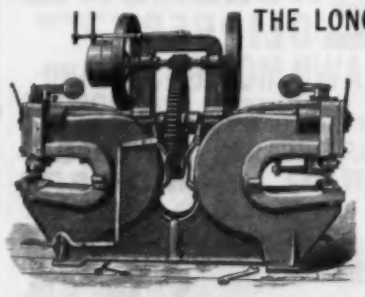

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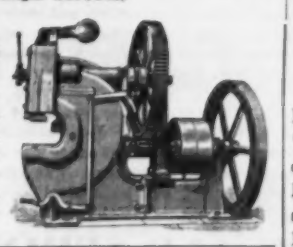

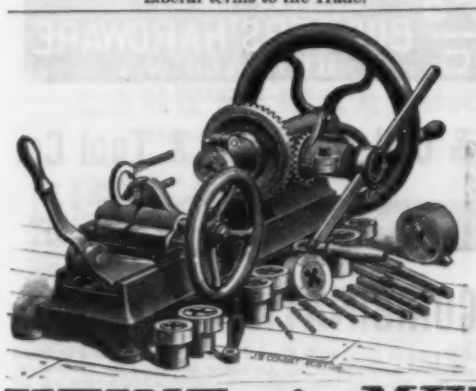

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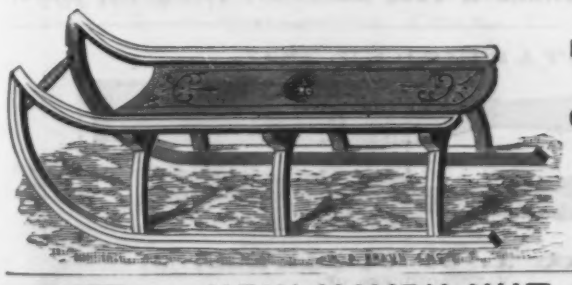

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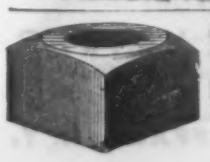

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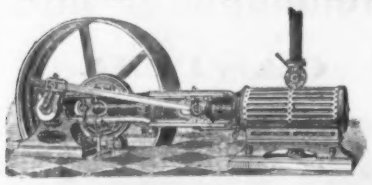

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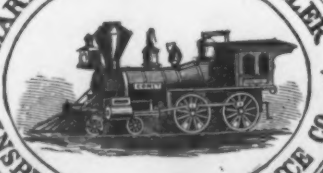

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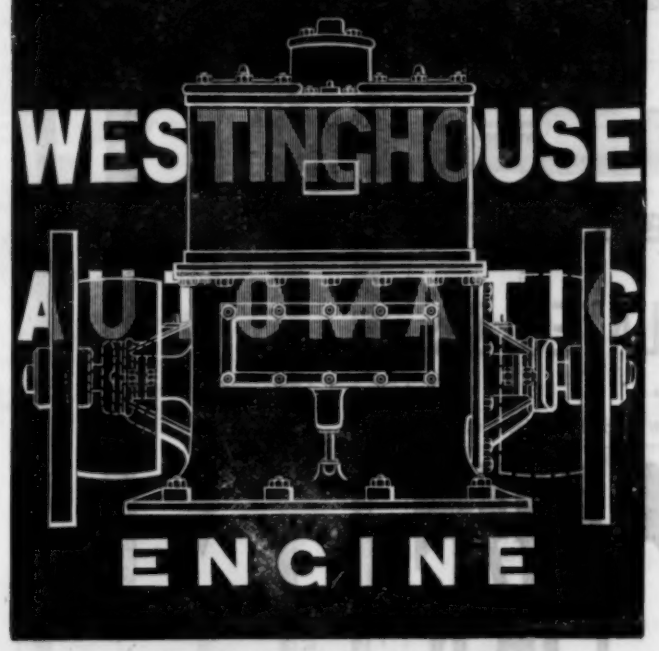

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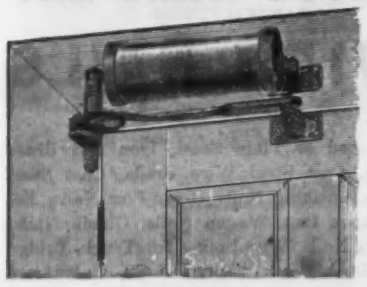

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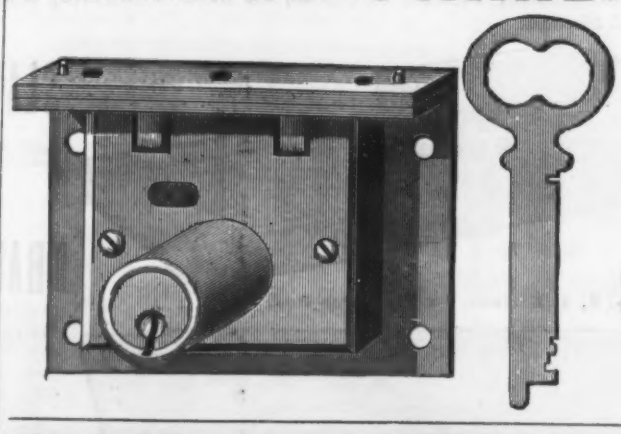

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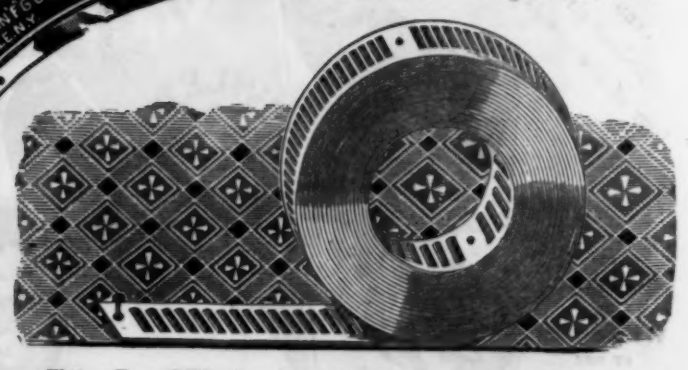

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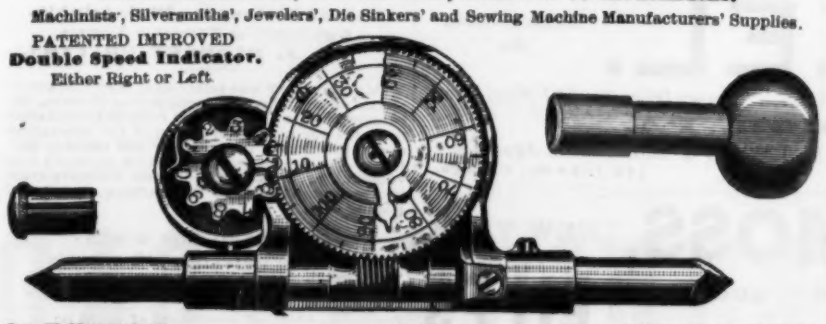

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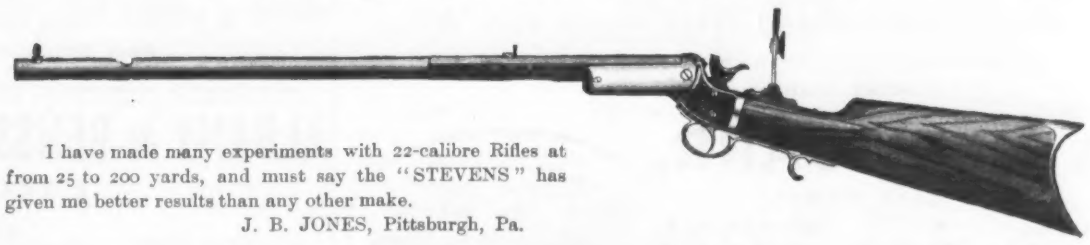

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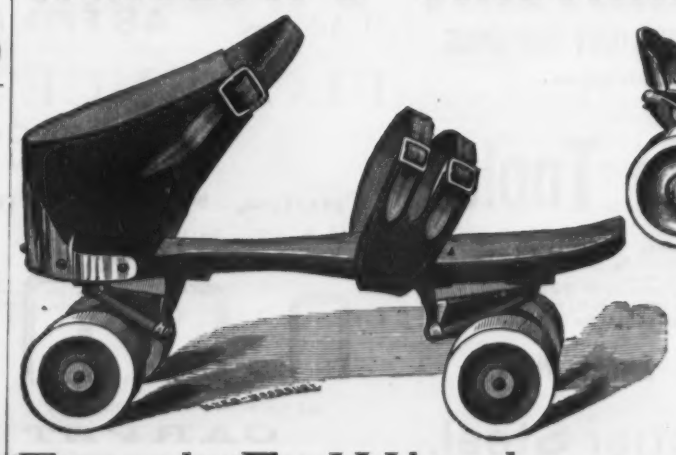

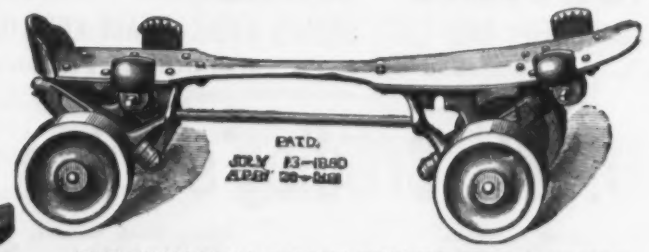

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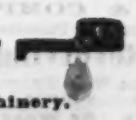

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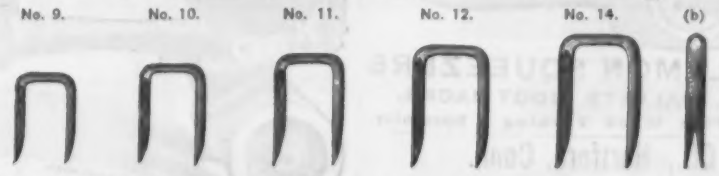

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This list excludes all ordinary trade announcements proper, and is strictly confined to trade-marks and brands, whether blocks, electros or other appliances for illustrations, with just sufficient letter-press to describe the kind of article to which the mark, &c., is applied, and the names and addresses of the owners or lawful users. For the sake of uniformity in space and charges, each mark occupies a space measuring 1 inch deep by 1½ inches wide, and the uniform charge is $2.50 (10s.) only for each such space, payable in advance unless we have already an open advertising account with the firm giving the order.

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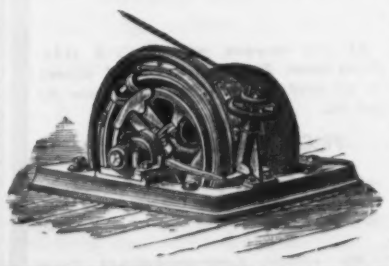

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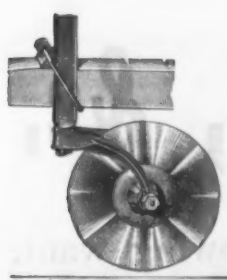

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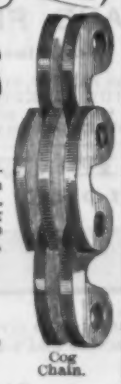

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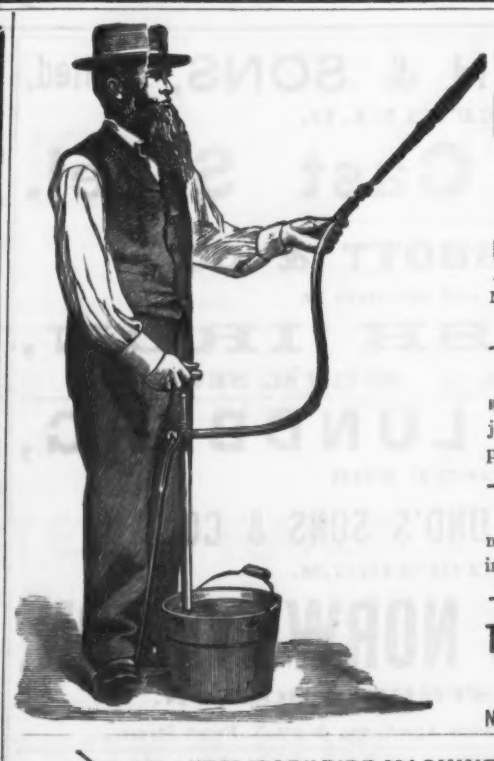
SOLE MANUFACTURERS.



Prouty's Patent PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

It will throw a continuous jet FROM FORTY TO SIXTY FEET. A new pattern jet and spray nozzle is sent with each pump.

Especial attention is called to the material and workmanship exhibited in these pumps.

THE NEW ENGLAND BUTT CO.

PROVIDENCE, R. I.

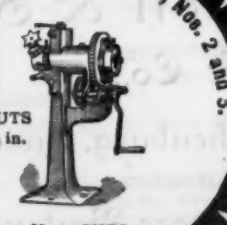
NEW YORK OFFICE, 99 Chambers St.

No. 1 "ECLIPSE" PIPE MACHINE IS JUST THE TOOL FOR PLUMBERS AND PIPE-FITTERS.

HAVE YOU NOT ENOUGH PIPE-WORK TO MAKE ONE OF THESE MACHINES PAY FOR ITSELF? WRITE US FOR CIRCULAR AND PRICE-LIST.

Nos. 2 & 3 "ECLIPSE" PIPE MACHINES

Can easily be worked by one man. Are simple, durable and efficient Tools, and worthy the notice of all who have to cut large Pipes.



Manufactured by Pancoast & Maule, Philadelphia, Pa.

PIPE MACHINES

It is Simple, Powerful, easily carried about, and Cheap.

THE HARRINGTON & KING PERFORATING CO.,

Main Office and Works, Nos. 48 to 51 S. Jefferson Street, Chicago.

MINING SCREENS for all kinds of ORES.

HEAVY STEEL AND IRON PLATES For Screening COAL, STONE, PHOSPHATE, ETC.

PERFORATED SHEET METALS

FOR ALL KINDS OF GRAIN CLEANING MACHINERY in any size and for all uses. REVOLVING SCREENS of every description made to order. STAMP BATTERY SCREENS a Specialty.

PERFORATED TIN & BRASS

Of All Sizes for FILTERS, STRAINERS, VENTILATORS, &c., &c.

Iron, Steel, Copper, Brass and Zinc Punched to any size and thickness required.

Branch Office, 100 Beekman St., New York.

The F. F. ADAMS COMPANY, Erie, Pa.

THE LATEST THING OUT.

IDEAL MOUSE TRAP.

So perfectly simple in construction there is nothing to get out of order, as is the case with all other traps made on this principle. Guaranteed to give perfect satisfaction. Send for sample gross and you will not have any other trap that catches mice alive. The inventor of the Ideal invented all of the leading traps in the market today, and he says this one is perfection. Great care is taken in the manufacture of the Ideal, and every trap is perfect. A single trap for inspection will be sent by mail upon receipt of 50c. in stamps.

The Cyclone Mouse Trap.

We invite the attention of dealers to this "Novelty" in Mouse Traps. Patented Nov. 6, 1883, and now having an immense sale. It is cheap, durable and attractive, and so sensitive that the mouse who ventures to but touch his nose to the bait box is doomed. Our salesmen on the road say it is the most popular Trap ever offered to the trade. One of our men in a single short trip sold 25,000. The retail price is only 10 cents each, and yet they afford big profits to the dealer. We will send a sample by mail for inspection, upon receipt of five 2-cent stamps. Send for our Illustrated Catalogue.

SHEET-IRON BUILDING MATERIALS.

ROOFING. Patent Cap Seam Roofing, in Four Styles. In Sheets or Rolls.

SIDING. Crimped Iron, for Siding or Roofing for Elevators, Mills and Factories.

CEILING. Paneled and Crimped Iron Ceiling. Durable, Attractive, Fire-proof.

Send for Prices and Circulars to

A. NORTHROP & CO., 97 First Ave., PITTSBURGH.

PHILADELPHIA.

Lloyd & Supplee Hardware Co.

erms, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Anvils.
Peter Wright's, ℔ ..... 10½ @ 10¾¢
Trenton ..... 9¾¢
Eagle Anvils, American, 10¢ ..... dis. 20 %

Apple Parers.
Globe Apple Parers ..... $5.50 net
Penn Apple Parers ..... 5.50 net
White Mountain 5.50
Lots of 10 to 25 dozen, special prices.

Axes.
Hunt's Kentucky and Yankee, ℔ dos. net $7.25
Robert Mann, ℔ doz. net 7.25
Richland Chief 7.25
Beveled Axes ..... add 50¢
Double Bit Axes, net $12.00

Augers and Auger Bits.—New List, January 7, 1880.
Bates' Nut Augers ..... dis 60 %
Cook's Augers ..... dis. 55 %
Watrous' Ship Augers ..... dis. 15 %
Benjamin Pierce Auger Bits ..... dis. 40 %
New Haven Copper Company ..... dis 60 %
Snell's Augers and Bits ..... dis 60 %
Snell's Ship Augers ..... dis 15 %
Cook's Auger Bits ..... dis 55 %
Jennings' Auger Bits, new list Jan. 1, 1884 ..... dis. 25 %
Bonney's Pat. Hol. Augers, list $48 ℔ doz. ..... dis. 40&10 %
Stearns Pat. Hol. Augers, list $48 ℔ doz. ..... dis. 20&10 %

Balances.
Light and Common ..... dis. 40&10 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells ..... dis. 75 @ 75 & 10 %
Swiss Pattern Hand Bells ..... 60 %
Connell's Door Bells ..... dis. 15&10 %
Gt. Western & Kentucky Cow, new list ..... dis. 70 %

Boring Machines
Upright, without Augers ..... List, $5.50 } dis. ..... 50&5 %
Angular, without Augers ..... List, 6.75 }

Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 ..... dis. 75&12½ %
Philadelphia Carriage Bolts ..... new list. dis. 75&10 %
Stanley, Wrought Shutter ..... dis. 50, 10&10 %

Braces.—Barber's ..... dis. 40&5 %
Backus ..... dis. 50&5 %
Spofford ..... dis. 50&5 %
American Ball ..... dis. 55 %

Butts.—Cast Fast Joint, Narrow ..... dis. 40&10&10 %
Cast Fast Joint, Broad ..... dis. 40&10&10 %
Cast Loose Joint, Narrow ..... dis. 60&10 %
Cast Loose Joint, Broad ..... dis. 60&10 %
Cast Acorn, Loose Pin ..... dis. 60&10 %
Cast Acorn, Japanned ..... dis. 60&10 %
Cast Mayer's Loose Joint ..... dis. 60&10 %
Wrought Loose Pin ..... dis. 60&2½ @ 60&2½&10 %
Wrought Table Hinges and Back Flaps ..... dis. 55&10 @ 55&10&10 %
Wrought Narrow Fast ..... dis. 55&&10 @ 55&10&10 %
Wrought Loose Joint ..... dis. 60&2¼ @ 60&2½&10 %

Blind Butts.
Parker ..... dis. 75&2 %
Clark ..... dis. 75&10&2 %
Shepard ..... dis. 75 %
Lull & Porter ..... dis. 80&10 %
Huffer's ..... dis. 50 %

Casters.—Bed (new list July 1, 1880) ..... dis 50&55 %
Plate ..... dis 50 @ 55 %

Chains.—German Halter and Coil, list June, 1884 ..... dis. 50 @ 55 %
Galvanized Pump ..... ℔ ℔ 7¢ net
Best Proof Coil Chain—English.

℔ ℔	9/16	5/8	5-16	3/4	7-16	1/2 in.
	9¼	6¾	5¾	5	4¾	4½

Chisels.—Socket Framing ..... dis 70&10 %
Socket Firmer ..... dis 70&10 %
Butcher's ..... $5.00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1, 1880) ..... dis 50 %
Enterprise ..... dis 20&10 %

Cutlery.—Walden Pocket ..... new list net
Pennsylvania Knife Co ..... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ..... dis 70&10 %
Adjustable Handle ..... dis 20 %

Fry Pans.
Tinned ..... dis 45 %

℔ doz..	$3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No.	0	1	2	3	4	5	6	7	8

Burnished ..... dis. 60&10&10 %

℔ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson ..... dis 60 %
Disston ..... dis 60 %
Butcher ..... dis 60 %

Fluting Machines.
Eagle—3½ in. roll ..... each, $2.15 } dis 35 %
Eagle—5½ in. roll ..... each, 2.85 }
Crown—4½ in. roll ..... each, 3.50 }
Crown—6 in. roll ..... each, 4.00 } dis 35 %
Crown—8 in. roll ..... each, 6.50 }
Geneva Fluter ..... dis 25 %
Favorite com. Fluter and Sad Iron ..... ℔ doz., $10.50 net

Hammers.
Yerkes & Plumb's, new list ..... dis 40 %
Maydole Hammers ..... dis 15 %
Howell A. E. Nail Hammers ..... ℔ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut ..... 33¢ pair net
Boynton Loop Handles Cross-Cut ..... 33¢ pair net

Hatchets.
Yerkes & Plumb, new list ..... dis 40&5 %
Hunt ..... dis 35 %

Hinges.
Strap and T ..... dis 60, 10, 10&2 @ 70 %

Horse Nails.

Nos.	5	6	7	8	9	10	
Globe	26	23	21	20	19	18	dis 10&5 %
Vulcan	26	23	21	20	19	18	dis 12½ %
Ausable	30	27	25	24	23	22	dis 25&10 %
Pol'ed and P't'd & Blued & P't'd	31	28	26	25	24	23	dis 25&10 %
Clinton		23	21	20	19	18	dis 25&10 %
" Pol'ed & P't'd.		24	22	21	20	19	dis 25&10 %
Saranac	26	23	21	20	19	18	dis 20 %

Hay and Straw Knives.
Lightning ..... ℔ doz., $18.00 dis. 10 %
Electric ..... ℔ doz., 18.00 dis. 20 %
Wadsworth ..... ℔ doz., net 10.50
Walton Straw Knives ..... ℔ doz., net 17.00

Locks and Knobs.
Branford Locks ..... 60&2 %
Gaylord Cabinet ..... dis 45&2 %
Parker's Cabinet ..... dis 45&2 %
American Padlocks ..... dis 45&2 % cash
Scandinavian Padlocks ..... dis 50 %

℔ doz.	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	} dis 60 %
No.	57	58	59	60	61	62	63	
℔ doz.				$18.00		26.00	33.00	} dis 60 %
No.			64		65		66	

Lanterns.
Buckeye ..... large list, net; small list, net
Tubular ..... No. 0, $7.50; No. 1, $9.00 ℔ doz. net
Guards, 40¢ extra.

Lawn Mowers.—Pennsylvania ..... } new list,
Philadelphia ..... } dis 30&5
Excelsior ..... } &3 %

Lawn and Garden Pumps.
Holland Patent ..... list, $5.00, dis 10 %

Mattocks.
Long and Short Cutter ..... new list, 50&10 %
Pennsylvania Pattern ..... dis 50&10 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets ..... dis. 20&10 %
Stebbins' Gates ..... dis. 70&10&2 %
Lincoln's Gates ..... dis. 70&10 %
Landers, Frary & Clark's Petroleum ..... dis 40&5 %
Brass Liquor Cocks, new list Jan. 1, 1880 ..... dis. 60 %
Cork Lined Cocks ..... dis. 70 %

Meat Cutters.
Dixon's ..... dis. 40 %
Woodruff ..... dis. 40 %
Stowe ..... dis. 40 %
Hale's ..... new list, dis. 60, 10&2 cash
American ..... dis
Stuffers ..... dis. 40 %
Enterprise Stuffers ..... dis. 25 %

Planes.—Sandusky Tool Co ..... dis. 20&10 %
Ogonts ..... dis. 25&10 %
Ohio and Auburn ..... dis. 20&10 %
Bailey (S. R. & L. Co.) ..... dis. 20&10 %

Plane Irons.—Ohio Tool Co ..... dis. 20&10 %
Butcher's ..... $5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable ..... dis. 65&10&10 %
Stanley's Non-Adjustable ..... dis. 65&10&10 %

Picks.—New list ..... 60 %

Razor Strops.
Lamont Combination ..... ℔ doz. $4.00
Lamont Combination ..... 1 gross lots $42.00
Imitation Emerson ..... ℔ doz. $2.00

Rules.—Stanley Boxwood ..... dis. 75&10&10 %
Stanley Ivory ..... dis. 55 %

Steelyards.—Hart's Pattern ..... dis. 40 %

Per doz.	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs.	50	100	150	200	250	300

American Pattern ..... dis. 40 %

Per doz.	$8.00	10.25	13.75	15.00	16.75	19.50
Lbs.	50	100	150	200	250	300

Scale Beams ..... 55@60 %
Casters ..... 25 %

Squares.
Steel and Iron ..... dis. 50; full case ..... dis. 50&10&2 for cash
Try Squares, Stanley ..... dis 55&10 %
Disston's Try Squares ..... dis 40 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ..... ℔ doz $9.00 } 30
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ..... ℔ doz $8.50 }
Clipper No. 5, Painted Red, Boxed and Sharpened ..... ℔ doz $8.00

Saws.—Disston's Hand, Panel and Rip ..... dis 20&10 %
Disston's Circular ..... dis 45&10 %
Cross-Cut No. 2, Plain Tooth ..... dis 45&10 %
Cross-Cut Patent Tooth ..... dis 45&10 %
Cross-Cut Champion Tooth ..... dis 45&10 %

Shovels and Spades.
Oliver Ames & Sons, new list ..... dis 17½ %
Griffiths ..... dis 50 @ 50&10
Rowland ..... dis 50 @ 50&10

Sad Irons.—4 to 10 ℔ ..... ℔ ℔ 2¾ @ 3¢
Mrs. Potts' Patent ..... dis 35 %

Stone.
Washita Extra ..... ℔ ℔ 23½¢
Washita No. 1 ..... ℔ ℔ 16¢
Washita No. 2 ..... ℔ ℔ 13¢
Washita Slips ..... ℔ ℔ 36¢
Washita Axe ..... ℔ ℔ 13¢ net
Hindostan Oil Stone No. 1 ..... ℔ ℔ 6¢ } dis 40 %
Hindostan Axe Stone ..... ℔ ℔ 8¢ }
Hindostan Slips ..... ℔ ℔ 10¢ }

Screws.
Flat Head Iron ..... dis 75 %
Flat Head Brass ..... dis 75 %
Round Head Brass ..... dis 65 %
Round Head Iron ..... dis 70 %

Spoons.
Plated ..... dis 50&5&5 %
German Silver ..... dis 40&5 %
Britannia, Boardman's ..... dis 60 %
Britannia, Parker's ..... dis 60&10 %
Tinned ..... dis 10 %

Springs.—Torrey ..... dis 50 %
Gem No. 3 small Japanned ..... $2.00 } dis 50&10 %
Gem No. 2 medium Japanned ..... 2.75 }
Coil No. 10 ℔ gross net $6.00
Other Standard Springs ..... dis 50&10 %
Warner Door Springs, ℔ doz. $2.50 ..... dis 40 %
Standard Spring Hinger—
Single No. 0, ℔ doz. net $1.25
Single No. 1, ℔ doz. net 1.50
Other Standard Spring Hinges ..... dis 25&10 %

Stocks and Dies. ..... dis 10 and 5 %

Stove Polish.—Gem ..... ℔ gross, $4.50, dis 5 %
Dixon ..... 6.00, dis 10 %
Fire Fly ..... $3.00 gross, net

Tacks.
Shoe Nails—4-8, and over, 7¢ ..... } 10 %
Shoe Nails—3½-8, and under, 8¢ ..... }
Double Pointed Tacks ..... dis 70&10 %

Traps.
Genuine Oneida—Newhouse ..... dis 35 %
Im. Oneida—Newhouse list. First qual ..... dis 60&10 %

Vises.—Solid Box. Trenton new list ..... dis 45 @ 50 %

Wrenches.—Agricultural ..... dis 75 %
Coes' Genuine ..... dis 60&3 %
Coes' Mechanics' ..... dis 60&10&3 %
Coes' Mechanics,' Mall. Bar ..... dis 70&15 %

Wire.
Bright or Annealed, No. 0 to 18 ..... dis 67½ %
Bright or Annealed, No. 19 to 26 ..... dis 70 %
Bright or Annealed, No. 27 to 36 ..... dis 75 %
Coppered, 0 to 18 ..... dis 62½ %
Tinned Broom Wire ..... dis 62½ %
Galvanized Barb Wire ..... 7¼¢
Painted Barb Wire ..... 6¾¢
Galvanized, No. 7 to 18 ..... Market List, dis 47½ @ 50 %

Wringers.
Peerless No. 2½ ..... $30.00 } dozen lots $3.00 per dozen.
Peerless No. 2 ..... 33.00
Universal No. 2½ 30.00
Universal No. 2 ..... 33.00
Novelty No. 2, for common tubs 30.00
Novelty No. 3, " " 34.50
Excelsior E, for stationary tubs 39.00
Excelsior F " " 43.50

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ℔ cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.

1¼ to 4 by ⅝ to 1 inch ..... 2.5¢
4¼ to 6 by ⅜ to 1 " ..... 2.6¢
1¼ to 6 by 1¼ to 1½ " ..... 2.6¢
1¼ and 1¾ by ¾ to ¾ " ..... 2.6¢
1 and 1¼ by ⅜ to ¾ " ..... 2.7¢
⅝, ¾ and ⅞ by ⅝ to ¾ inch ..... 2.9¢

Rounds and Squares.

1 to 1¼ ..... 2.5¢ | ⅝ to 9-16 ..... 2.7¢
2 to 2¾ ..... 2.7¢ | ½ to 7-16 ..... 2.9¢
2¾ to 3¼ ..... 3.0¢ | ⅜ ..... 3.1¢
3¾ to 4 ..... 3.5¢ | 5-16 ..... 3.3¢
4¼ to 5 ..... 4.0¢ | ¼ ..... 3.5¢
¾ to ⅞ ..... 2.6¢ | 3-16 ..... 5.5¢

Oval Iron.

¾ to 1¼ ..... 2.9¢ | ⅛ ..... 3.3¢
⅝ to ¾ ..... 3.1¢ | ⅜ ..... 3.7¢

Half Oval and Half Round.

¾ to 1¼ inch ..... 3.2¢ | ⅛ inch ..... 4.0¢
½ to ¾ " ..... 3.7¢ | ⅜ " ..... 5.5¢

Horse Shoe.

⅝ to 1¼ by 5-16 to ½ inch ..... 3.5¢

Wagon Box Iron.

¼ inch, Nos. 13 and 14 ..... 3.7¢
⅛ " " 11 and 12 ..... 3.5¢
⅜ " " 13 and 14 ..... 4.0¢
⅜ " " 11 and 12 ..... 3.8¢
⅜ " " 13 and 14 ..... 4.4¢
⅜ " " 11 and 12 ..... 4.1¢

Hoop Iron.

3½ to 6 by ¼ and 5-16 inch ..... 2.7¢
1½ to 3½ by ¼ and 5-16 " ..... 2.7¢
1 to 1½ by ¼ and 5-16 " ..... 2.8¢
⅝ to ⅞ by ¼ and 5-16 " ..... 3.0¢
⅝ and ⅞ by ¼ and 5-16 " ..... 3.5¢

Light Bands.

1½ to 6 by ⅛ to 3-16 ..... 3.0¢
1½ to 6 by Nos. 11 and 12 ..... 3.1¢
1 to 1½ by ⅛ to 3-16 ..... 3.1¢
1 to 1½ by Nos. 11 and 12 ..... 3.2¢
⅛ and 13-16 by ⅛ to 3-16 ..... 3.4¢
⅛ and 13-16 by Nos. 11 and 12 ..... 3.5¢
⅜ and 11-16 by ⅛ to 3-16 ..... 3.7¢
⅜ and 11-16 by Nos. 11 and 12 ..... 3.8¢
⅜ and 9-16 by ⅛ to 3-16 ..... 4.0¢
⅜ and 9-16 by Nos. 11 and 12 ..... 4.1¢
⅛ inch by ⅛ and 3-16 ..... 4.3¢
½ inch by Nos. 11 and 12 ..... 4.4¢

Hoop Iron.

1¼ to 4, Nos. 13, 14 and 15 ..... 3.3¢
1¼ to 2, Nos. 16, 17 and 18 ..... 3.4¢
1¼ to 2, No. 19 ..... 3.5¢
1¼ to 2, No. 20 ..... 3.6¢
1¼ to 2, No. 21 ..... 3.7¢
1¼ to 2, No. 22 ..... 3.8¢
15-16, 1, and 1¼, Nos. 13, 14 and 15 ..... 3.5¢
15-16, 1, and 1¼, Nos. 16, 17 and 18 ..... 3.6¢
15-16, 1, and 1¼, Nos. 19 and 20 ..... 3.7¢
15-16, 1, and 1¼, No. 21 ..... 3.8¢
15-16, 1, and 1¼, No. 22 ..... 3.9¢
⅞, Nos. 13, 14 and 15 ..... 3.7¢
⅞, Nos. 16, 17 and 18 ..... 3.8¢
⅞, Nos. 19 and 20 ..... 3.9¢
⅞, No. 21 ..... 4.0¢
⅞, No. 22 ..... 4.1¢
13-16, Nos. 13, 14 and 15 ..... 3.9¢
13-16, Nos. 16, 17 and 18 ..... 4.0¢
13-16, Nos. 19 and 20 ..... 4.1¢
13-16, No. 21 ..... 4.2¢
13-16, No. 22 ..... 4.3¢
¾, Nos. 13, 14 and 15 ..... 4.0¢
¾, Nos. 16, 17 and 18 ..... 4.1¢
¾, Nos. 19 and 20 ..... 4.2¢
¾, No. 21 ..... 4.3¢
¾, No. 22 ..... 4.4¢
11-16, Nos. 13, 14 and 15 ..... 4.2¢
11-16, Nos. 16, 17 and 18 ..... 4.3¢
11-16, Nos. 19 and 20 ..... 4.4¢
11-16, No. 21 ..... 4.5¢
11-16, No. 22 ..... 4.6¢
⅝, Nos. 13, 14 and 15 ..... 4.4¢
⅝, Nos. 16, 17 and 18 ..... 4.5¢
⅝, Nos. 19 and 20 ..... 4.6¢
⅝, No. 21 ..... 4.7¢
⅝, No. 22 ..... 4.8¢
⅝, No. 23 ..... 4.9¢
9-16, Nos. 13, 14 and 15 ..... 4.6¢
9-16, Nos. 16, 17 and 18 ..... 4.7¢
9-16, Nos. 19 and 20 ..... 4.8¢
9-16, No. 21 ..... 4.9¢
9-16, No. 22 ..... 5.0¢
9-16, No. 23 ..... 5.1¢
½ inch, Nos. 13, 14 and 15 ..... 4.8¢
½ inch, Nos. 16, 17 and 18 ..... 4.9¢
½ inch, Nos. 19 and 20 ..... 5.1¢
½ inch, No. 21 ..... 5.2¢
½ inch, No. 22 ..... 5.3¢
½ inch, No. 23 ..... 5.4¢

The prices under Hoop Iron do not apply to Cotton Ties.

1-10¢ ℔ ℔ extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ℔ ℔ extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.

1¼ to 2 in., cut to length.

9 to 11 ℔, ℔ set of 6 hoops ..... 3.5¢
8 ℔ and less than 9 ℔, ℔ set of 6 hoops ..... 3.6¢
Less than — ℔, ℔ set of 6 hoops ..... 3.8¢

Extras for Cutting to Length all Preceding Iron.

All Iron, including Tire ..... 1.10¢

Tank Iron.

No. 9 and heavier ..... 3.3¢
Plow Slabs ..... 3.5¢
Plow Wings ..... 3.8¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.5¢	5.0¢	6.5¢
Nos. 15 to 17	3.8¢	5.3¢	6.8¢
Nos. 18 to 21	4.1¢	5.6¢	7.1¢
Nos. 22 to 24	4.3¢	5.8¢	7.3¢
Nos. 25 and 26	4.5¢	6.0¢	7.5¢
No. 27	4.7¢	6.2¢	7.7¢
No. 28	5.1¢	6.6¢	8.1¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.

1st quality (A) ..... 10½¢ | 2d quality (B) ..... 9.0¢

Galvanized C. H. B.—(Charcoal Hammered Blooms.)

Nos. 14 to 20	12¢	No. 27	15¢
Nos. 21 to 24	13¢	No. 28	16¢
Nos. 25 and 26	14¢	No. 29	18¢

50 @ 53½ % discount.

Coal Screen Iron.

1¾ by ¾ by 5-16 ..... 3.0¢ | 1 by ¾ by 5-16 ..... 3.5¢

Angle Iron.

2¼, 2, 2½ and 4 inch ..... 3.3¢
1¼, 1¾, 2 and 2¼ " ..... 3.3¢
1¼ inch ..... 3.4¢
1 " ..... 3.6¢
1¼ by 1 inch, for Plow Handles ..... 3.8¢
1½ by ⅝ " " " ..... 3.8¢
1¾ by ¾ " " " ..... 3.9¢

T Rail.

8 lbs. to the yard ..... 2.9¢ | 20 lbs. to the yard ..... 2.8¢
12 " " ..... 2.8¢ | 28 " " ..... 2.8¢
16 " " ..... 2.8¢ | 30 " " ..... 2.8¢

Splice Joints for 12, 16 and 20-lb. Rail, 40¢ each; 28 and 30-lb. Rail, 50¢ each; 40-lb., 60¢ each.

2¼ by ⅜ and ½ Spikes for 20 and 28-lb. Rail ..... 3¾¢
2¼ and 3 by ⅝ " " 12 and 16-lb. " ..... 4.0¢
2¼ by 5-16 " " 8-lb. Rail ..... 4¼¢

Flat Rails.—Punched and Countersunk.

1¼ to 2 by ⅛ to ⅝ inch ..... 3.0¢
1¼ by ⅜ and 7-16 inch ..... 3.2¢
1¼ by ½, 7-16 and ⅝ inch ..... 3.5¢

Juniata Nail Rods ..... 6.5¢
Norway Nail Rods ..... 8.0¢
Guard Iron, ¼x⅝ and ½x⅝ ..... 4.0¢
Guard Iron ¾x⅛x19-16 and ½x⅝x1¼ ..... 4.2¢
Drag Bars ..... 3.3¢
Dropper Bars ..... 3.8¢
Cylinder and Landside Iron ..... 3.2¢
Plow Beam Iron ..... 3.0¢

Nails.
See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.
Square, Flat, Octagon and Round.

⅝ to 2 inches, inclusive ..... 9¼¢
1-16 and 2¼ to 3 inches ..... 10¼¢
¼ and 3¼ to 4 " ..... 11¼¢
7-32 and 4¼ to 5 " ..... 12¼¢
3-16 and 5¼ to 6 " ..... 15¼¢
5-32 inch ..... 20¼¢
⅛ " ..... 25¢
Oil Well Steel Forgings ..... 29¢

Machinery Steel.

	Crucible	Bessemer & Open Hearth.
Ordinary Sizes, ⅝ to 2 inch Round	5¢	3½¢
5-16 and 2¼ to 3 inches	6¢	4½¢
¼ and 3¼ to 6 "	7¢	5½¢
7-32 inch	9¢	7¢
3-16 "	11c	9¢

Square, Flat and Octagon, ½¢ extra throughout the list.
Cut to specified lengths, ½¢ extra.

Hammer Cast Steel.

Crucible Cast Steel ..... 6¢
Open Hearth Cast Steel ..... 5¢

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	11¢	10¢	8¢	¾¢

1¢ extra for each additional gauge.
Cut to multiples or specified lengths, ½¢ extra.

Miscellaneous Cast Steel.

Auger and Auger Bit ..... 5¢
Axle Steel for carriages and wagons ..... 5¢
Frog Points and Plates ..... 6¢
Frog Side Bars ..... 5¢
Pick, plain (hammered) ..... 5¢
Pick and Mattock, beveled (rolled ..... 5¢
Skate Steel ..... 6¢
Table Cutlery, plain ..... 5¢
Table Cutlery, beveled ..... 6¢
Pike and Cant Hook ..... 7¢
Coal and Granite Wedge ..... 7¢
Roller ..... 7¢
Spindle, subject to Machinery classification ..... 6¢
Trap Spring Steel ..... 8¢
Forged Crank Pins and Lathe Spindles ..... 7½¢
Piston Rods, plain ..... 5¢
Piston Rods, forged to shapes ..... 7½¢
Slide Bars, plain 6c
Slide Bars, forged to shapes ..... 7½¢

Open Hearth or Bessemer

Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick ..... 4½¢
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick ..... 6¢
Circulars and semi-circulars, when ordered separately 7c
Smoke Stack, to shape ..... 6¢
Locomotive Tank Steel ..... 5¢

File Cast Steel.

Square, Round, Half Round and Flat Bastard, 8-inch and over ..... 5¢
Mill Saw, 8-inch and over ..... 6¢
Taper, 3¼-inch and over ..... 7¢
Horse and Shoe Rasp ..... 6¢

Spring Cast Steel.

Spiral, Taper, cut to lengths ..... 5¢
" ..... 6¢

Tire Cast Steel.

1x¼ and over ..... 7¢
1x3-16, ⅞x3-16 and ¼ ..... 7½¢
1 and 13-16x¼ and 5-32, ⅞x3-16 and 5-32 ..... 9½¢
⅝ and ⅝x¼ and 3-32 and 12 g ..... 10¢
Solid Safe Cast Steel ..... 6¢
Three and Five Ply Cast Steel ..... 8¢

Agricultural Implement Cast Steel.

Fork and Rake, Crucible ..... 5¢
Horse Rake Steel, cut to lengths, Crucible ..... 6¢
Hoe, Crucible ..... 6¢
Corn Stalk Cutter, beveled ..... 5¢
Beveled Hoe and Shovel Steel in Bars ..... 5¢
Crucible Plow Steel in Slabs ..... 5¢

Bessemer and Open Hearth.

Spring ..... 3½¢
Spring spiral and taper, cut to lengths ..... 4¢
Tire, 2-16 thick and above ..... 3½¢
Toe Calk ..... 3½¢
Plow ..... 3½¢
Axle Billets ..... 3½¢
Sleigh Shoe ..... 3½¢
Cutter Shoe, cut to lengths and tapered ..... 4½¢
Scythe Back Steel ..... 4¢
Grain Drill Bars ..... 4¢
Grain Drill Points ..... 5¢
Rolling Coulter Blanks, cut and punched ..... 9½¢
Thrasher Steel ..... 4¢
Thrasher Teeth ..... 5½¢
Rolled Hammer Billets ..... 4¢

Terms.—Four months; 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.
Furnace Floor and Straightening Plates ..... 1½¢
Housings and Castings not otherwise specified ..... 2½¢
Guide Plates ..... 3¢
Spindles and Coupling Boxes ..... 2¢
Sand Rolls and Pinions, large size ..... 2½¢
Sand Rolls and Pinions, small size ..... 3 ¢
Pipe Mill Castings ..... 5 ¢
Rolling Mill Castings under 50 ℔ ..... 4 ¢
Spur and Bevel Wheels, large ..... 4 ¢
Spur and Bevel Wheels, small ..... 4½¢
Pulleys up to 30 inches ..... 4½¢
Pulleys over 30 inches ..... 4½¢
Engine Castings, light ..... 4½¢
Engine Castings, heavy ..... 4 ¢

Chilled Rolls.

6 to in. diam., to 20 in. long ..... 4 ¢
8 to 15 in. diam., 8 to 40 in. long ..... 4 ¢
25 to 24 in. diam., 15 to 72 in. long ..... 3½¢
14 to 31 in. diam., 72 to 108 in. long ..... 3½¢

After October 1, 1881, no discounts will be made at settlement, as heretofore, prices quoted being net.

White and Red Lead.
Strictly Pure White Lead in Oil in kegs, 6¼¢; in 25 ℔ Tin Pails, ½¢ ℔ ℔ over keg price; 12½ ℔ Tin Pails, 1¢ ℔ ℔ over keg price; assorted, 1 to 5 ℔ cans, 3¢ ℔ ℔ over keg price.
Dry White Lead in barrels ..... 6½¢
Red Lead, very brilliant, in kegs and barrels ..... 6¢
Litharge (Potter's Lead) " " " ..... 6¢
Freights equalized with all points where White Lead is made.
Terms: Note at 60 days, or if paid within 15 days from date of invoice a discount of 2½ per cent. will be allowed, but not otherwise.

Window Glass.
Discount, 60&10 % on Single Strength, 60&20 % on Double.
Prices current, ℔ box of 50 feet.

Single Strength.

United Inches	Sizes.	AA.	A.	B.	C.
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
39	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7.75
54	15 x 34 to 24 x 30	12.25	10.75	9.00	....
60	26 x 28 to 24 x 36	13.00	11.50	9.75	....
70	26 x 36 to 26 x 44	14.50	13.25	10.75	....
80	26 x 46 to 30 x 50	15.00	14.00	11.25	....
84	30 x 52 to 30 x 54	....	....	....	....
90	30 x 56 to 34 x 56	....	....	....	....
94	34 x 58 to 34 x 60	....	....	....	....
100	36 x 60 to 40 x 60	....	....	....	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.50
39	11 x 14 to 15 x 24	14.50	13.25	12.50	11.25
48	16 x 24 to 20 x 28	17.25	15.75	14.00	....
54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
94	35 x 58 to 34 x 60	29.25	27.75	24.00	....
100	36 x 60 to 40 x 60	33.25	30.00	27.75	....

Sizes above — $10 ℔ box extra for every 5 inches.

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, Bakewell & Co.'s Goods.
Axes, Single Bit, Lippincott ..... per doz., $7.25
Axes, Single Bit, James & Co ..... per doz. 6.75
Axes, Double Bit, Lippincott ..... per doz., $13.00
Axes, Double Bit, James & Co ..... per doz., 10.00
Drain Tools, list ..... dis 20 %
Hoes, Planters' ..... dis 60 %
Hoes, Scovill Pattern ..... dis 60 %
Hoes, Handled, Square Eye, German ..... dis 50 %
Handles, Cross Cut ..... per doz., $2.50
Handles, Shovel, Bent, Bored, Riveted ..... per doz., 2.25
Saws, Circular ..... dis 45 %
Saws, Long ..... dis 40 %
Saws, Cross-Cut, H. B. & Co., Champion, per foot net $0.30
Saws, Cross-Cut, Lippincott, Champion, per foot net $0.27
Shovels, list ..... dis 20 %
Spades, list ..... dis 20 %
Scoops, list ..... dis 20 %

RAILROAD OR CANAL BARROW.

With Jacobs' Patent Wheel.

Full sized, bent tray, planed and well finished. Bolted securely to frame. The legs extend up ward, serving as a brace to the bowl, to which they are bolted; they are also bolted to handles. This Barrow has the Jacobs Patent Wheel, superior in every way to any iron wheel manufactured. The wheel revolves on a fixed axle bolt, similar to a buggy wheel. The axle bolt holds the barrow firmly together. The Barrow for Railroad Contractors. Will outwear any other made, and displaces all others wherever introduced. Wheel painted. We also manufacture a full line of

ORE, BRICK, STONE AND GARDEN BARROWS.

Also Road Scrapers, Road Plows, Levelers, &c.

KILBOURNE & JACOBS MFG. CO.,

COLUMBUS, OHIO, U. S. A.

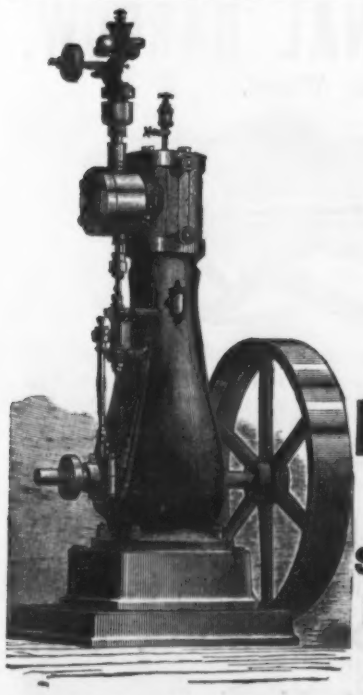
No. 99 IMPROVED CLOTHES WRINGER

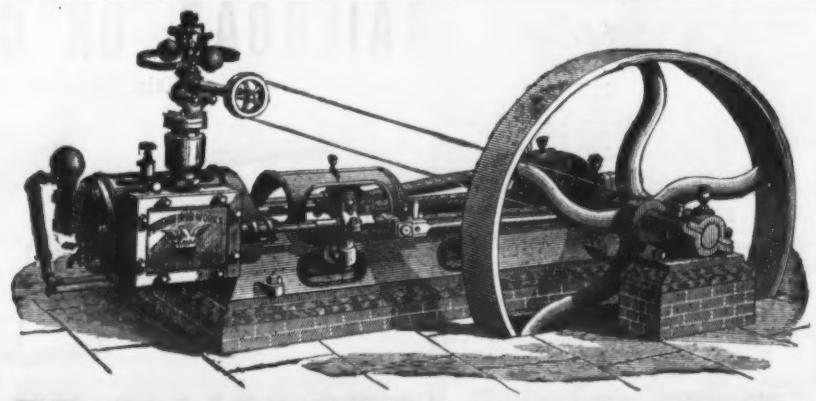
Showing the Wringer with Rolls Set Apart.

FOR SALE BY ALL JOBBERS.

Showing Wringer Ready for Use.

This Wringer has been a favorite for a quarter of a century. The only objection ever made to it was on account of the Rolls flattening under the pressure of its powerful springs when not in use. We have patented a very simple device to overcome this objection. The above cut shows this Wringer as in use, and also with the rolls set apart when not in use. All that is required to throw the rollers apart after using is to turn the crank backward, and while so turning push up the shields at each end of the rolls, as seen in the cut, thus throwing the lower shaft from the upper to the lower side of the lug cast in the shields





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The Scientific Portable Forges

HAND AND POWER BLOWERS,

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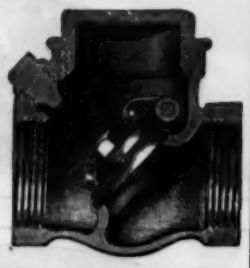
Straightway Swinging Stop and Check Valves.

The only Straightway Valve that can be ground in without being disconnected from Pipes.



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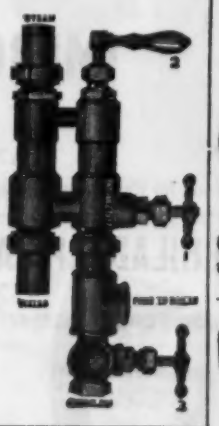

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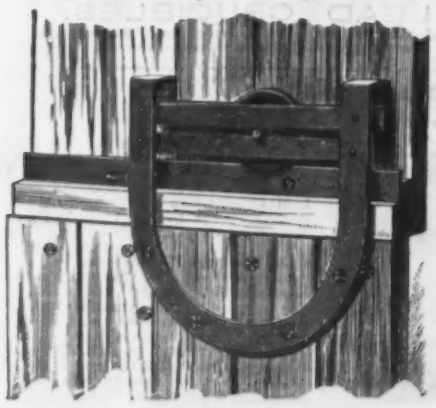
THE MOST PERFECT ANTI-FRICTION HANGER IN THE MARKET, BECAUSE

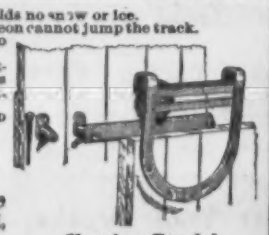
It is made entirely of Wrought Iron, except the Wheel, which has a Steel Axle.



It will not break.
It is practically free from wear.
It is almost noiseless in action.
It requires no oil.
It has a broad bearing on the door, and keeps in line.
It is by far the most durable.
It may be used with any track.
It is always in order.

LANE'S PATENT TRACK

is made of flat wrought iron and is easily put in position.
Catches and holds no snow or ice.
Door hung thereon cannot jump the track.
Is not subject to decay.
Requires no fitting, but is ready at once.



Showing Track.

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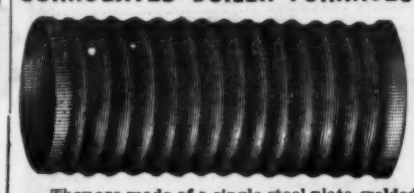
CORRUGATED BOILER FURNACES.



1. They are made of a single steel plate, welded at the bottom, with no joint in contact with the flame.

2. They give 30 per cent. more evaporative power.

3. They throw off all scale by their elasticity.

4. They do not destroy themselves by the variation of temperature, contracting and expanding as they do like an accordeon. They have not enough stiffness to work against the boiler heads.

5. They require, to comply with the rules of the Board of Trade in England, only *one-half* the thickness of plate of plain furnaces for equal working pressure.

6. Where a plain furnace of equal length, diameter and thickness collapsed at 225 pounds, the Corrugated stood 1020 pounds per square inch.

Since five years 700 steamers were fitted with these furnaces, among them the Alaska, Oregon, City of Rome, Servia, Elbe, Werra, Fulda, &c.

Perfect safety and greatest economy combined.

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WROUGHT-IRON

Punched Rail Fence.

Suitable for Private Residences, Parks, Court Houses, Cemeteries Public Grounds, &c. Made either plain or ornamental. Also manufacturers of the Iron Turbine Wind Engines, Buckeye Force Pumps, Buckeye Lawn Mowers, &c. Send for Illustrated Catalogue and Prices to

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With Switches and Turntables,

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HARRINGTON HOISTS,

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WITH AUTOMATIC STOP.

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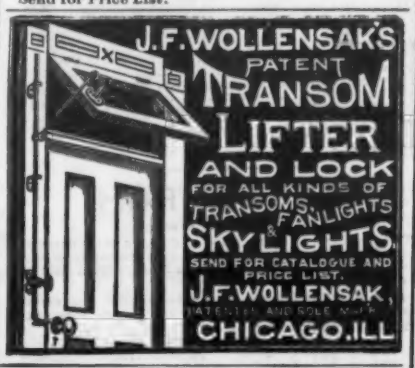

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Anvil & Vise.—
No. 1, $5.25; 2, $4.25; 3, $3.50 each.....dis 25 %

Augers & Bitts.—
L'Hommedieu's Ship Auger.....dis 15 %
Jenning's Bitts.....dis 25 %
Cook's Bitts.....dis 40 & 10 %
Shepardson's Double-Cut Bitts.....dis 45 %
Shepardson's Double Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₱ doz., $48; No. 3, ₱ doz., $60 list.....dis 20 %
Bonney's Extension Hollow Augers.....₱ doz $36.00
Snell's Bitts.....dis 60 %
Pierce's Bitts.....dis 50 %
Griswold Bitts.....dis 60 %

Axes.—Blue Jackets.....₱ doz $7.50
Dowse Handled Boys'.....dis 35 %

Ax Handles.—
Oak Extra, 31 in., No. A.....₱ doz $2.50
Oak Extra, 34 in., No. A.....₱ doz 2.50
Oak Extra, 31 in., No. B.....₱ doz 2.00
Oak Extra, 34 in., No. B.....₱ doz 2.00
Oak Extra, 31 or 34 in., No. C.....₱ doz 1.40

Axle Clips......dis 50 %

Balances.—Chatillon's.....dis 40 %

Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers).....₱ ft., 2¢
Cast Half Round.....₱ ft., ⅜, 3¢; ½, 4¢
Wrought Round.....₱ ft., ⅜, 3¢; ½, 4¢; ⅝, 5¢

Bells.—Connel's Crank Gong, reduced list..dis 15&10 %

Bird Cages.
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass M. B. & D. reduced list, 1879.....dis 33⅓ %

Blind Fasts.
No. 6 Fasts.....₱ C sets 6.00
Veazie Fasts.....₱ C sets 6.00
Shedd's.....₱ C sets 6.50

Blind Hinges.—Mall. Hook, 3 holes..₱ C sets 7.00

Brad Awl Handles.—
Phœnix Adjustable.....₱ doz $2.00

Belts.—Norway Iron Carriage.....dis 75&10 %
Common Carriage.....dis 80&20 %
Eagle Carriage.....dis 75&10 %

Borax.—Refined.....₱ ℔ 12¢

Boring Machines.—
Eagle Upright, each.....$5.50 list } dis 50 %
Eagle Angle, each.....6.75 list }

Braces.—Barber's.....dis 40&5 %
Spofford's.....dis 50&5 %
Backus's.....dis 50&5 %

Bracket Saws.—Holly Scroll Saw.....each $2.25
Bracket Saws, extra quality, to No. 8....₱ gro. 0.75
Steel Frame, with patterns.....₱ doz 6.50
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %

Bracket Saw Blades.—Griffith's pat., ₱ gross 75¢

Brackets.—
H. B. & M. Flower Pot, reduced list.....dis 1⅓&10 %
Bronzed Shelf, M. B. & D., new list.....dis 50&10 %
Store Shelf.....dis 40&10 %

Butts.—Union Fast Joint.....dis 40&10&10 %
Union Loose Joints.....dis 60&10 %
Union Japanned Acorn.....dis 60&10 %
Union Silvered Acorn.....dis 60&10 %
Union Boston Finish.....dis 70&10 %
Union Spiral Spring.....dis 25&10 %
Wrought Brass.....dis 75&10 %

Carriage Bolts.—Eagle Norway.....dis 75&10 %
Common.....dis 80&20 %

Carriage Jacks.—Climax No. 1.....₱ doz $20.00
Climax No. 1½.....₱ doz 15.00
Climax No. 2.....₱ doz 13.50
Universal.....dis 25 %
Universal No. 1.....each $2.00
Universal No. 2.....each 3.00
Universal No. 3.....each 4.00
Universal No. 4.....each 6.00
Universal No. 5.....each 6.50

Cartridges.—U. S. Cartridge Co.....dis 50&10 %

Cards.
Watson's make Horse & Curry....dis 10 % } Rev. List.
Watson's Cotton.....dis 10 % } Aug., 1883.
Watson's Wool.....dis 10 % }

Casters.—Bed and Table.....dis 50&10 %

Chain.
Coil 3-16.....₱ ℔ 10¢
Coil ¼.....₱ ℔ 7½¢
Coil 5-16.....₱ ℔ 6½¢
Coil ⅜.....₱ ℔ 6½¢
Coil 7-16.....₱ ℔ ¢
Coil ½.....₱ ℔ 5¢

Chalk.—White, Carpenter's.....₱ gross 60¢
Red, Carpenter's.....₱ gross 80¢
Blue, Carpenter's.....₱ gross $1.00
Crayons.....12¢

Chisels.—Peck, Stow & Wilcox.....dis 60&10&10 %
Underhill, Framing.....dis 35 %
Buck's Chisels.....dis 30 %

Coal Hods.—"Dover."—Galv'd, New List....dis 60 %
Japanned, New List.....dis 60 %

Cocks.—Brass. L. F. & Co.....dis 50&10 %

Coffee Mills.—New List.....dis 45 %

Copper Rivets.—.....dis 50 %

Cordage.—Manila, usual trade dis 1¢.....₱ ℔ 16¢
Jute.....₱ ℔ 8¢

Cow Ties......dis 50 %
No. 30 3 ft. No. 6 Wire, with toggle.....₱ doz $3.80
No. 35, 3 ft. No. 6 Wire, with snap.....₱ doz 4.00
No. 40, 3½ ft. No. 6 Wire, with toggle.....₱ doz 4.50
No. 45, 3½ ft. No. 6 Wire, with snap.....₱ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle.....₱ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap.....₱ doz 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle.....₱ doz 5.50
No. 65, 4½ ft. No. 3 Wire, with snap.....₱ doz 5.80

Crow Bars.—Cast Steel.....₱ ℔ 7¢
Iron Steel-pointed.....₱ ℔ 6¢

Cutlery.—Pocket American Shear Co.'s.....dis 40
Butcher Knives, Wood's, Lap Bolster, Square Handle.....dis 40 %
Steak Knives.....dis 40 %
Lap Bolster, Oval Handle.....dis 40 %
Sticking.....dis 40 %
Skinning.....dis 40 %
Butcher, Common Round Handle, Wood's.....dis 40 %
Shoe Knives, Wood's.....dis 30 %

Dividers.—Cook's.....dis 25 %

Dog Collars......dis 20 %

Door Springs.—Iron Rod.....₱ doz $1.62
Imitation Torrey's Rod.....₱ doz 1.45
Gem Coil, new list.....dis 50&10 %
Crown.....₱ doz $1.25
Warner's.....₱ doz 2.00

Door Stops.—Thurston's.....dis 50 %

Drawer Knobs.—Thurston's.....dis 50 %

Drills.—Morse Bitt Stock.....
Morse Straight Shank..... } dis 40 %

Emery.—Wellington Mills.....₱ ℔ 10¢
Walpole Emery Mills.....₱ ℔ 5¢
Turkish, in 10 ℔ cans.....₱ ℔ 7¢

Enameled Ware.—
Standard Mfg. Co. Kettles.....dis 60 %
Standard Sauce Pans.....dis 30 %

Felloe Plates.—Wrought.....₱ ℔ ¢

Files.—American File Co.....dis 50 %
Nicholson File Co.....dis 50 %

Fluting Machines.—Knox List, $4.00.....dis 25 %

Forks.—W. C. & Co. Manure.....dis 50 %
Eastern Tool Co.'s. Manure.....dis 60 %

Gimlet Bits.—
Genuine German, No. 125, 1-32 to 8-32.....₱ doz $1.00
Pierce's.....₱ doz .88

Glass Cutters.—Combination Glass Cutter and Knife Sharpener.....₱ doz $1.00

Grub Hoes.—K. P. & Co.'s No. 2, $11.50 ₱ doz. dis 50 & 10 %

Hammers.—Maydole's.....dis 15 %
Hartford Hammer Co.....dis 20 %

Hangers & Rollers.—Anti-Friction.....dis 50 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 50 %
Common Rollers.....dis 50 %
Victor Hangers.....dis 33⅓ %
Victor Rail.....dis 40&10 %

Hand Screws......dis 10 %

Hatchets.—C. F. Dowse, new list.....dis 35 %
Underhill.....dis 35 %

Hay Knives.—Lightning.....₱ doz $18.00, net

Hinges.—Strap and T (new list).....dis 60&10 %
Providence Plate.....₱ ℔ 5¢
Wrought Screw Hook.....₱ ℔ 5¢

Hoes.—Eastern Tool Co.....dis 60&10 %
W. C. & Co.'s.....dis 60 %

Hooks and Staples.—Brewers (new list)...dis 60 %

Horse Nails.

	No. 6	7	8	9	
Putnam Pointed	.24	.22	.21	.20	.....5&7 %
Bridgewater	.21	.19	18	.17	.....30 %

Ice Cream Freezers.—Packer's, new list.dis 50&5 %

Knobs.—"Norwalk." New list.....dis 60&2 %
Silver Glass.....dis 50&10 %
Silver Glass Bell Pulls.....dis 50&10 %

Lanterns.—Tubulars, No. 0.....₱ doz $7.50

Lawn Mowers.
Continental.....dis 40&10 %
Quaker City.....dis 40&5 %
National.....dis 50 %

Lead.—Sheet.....₱ ℔ 6½¢
Pipe.....₱ ℔ 5½¢

Locks.—Norwalk.....dis 60&2 %
Eagle Cabinet.....dis 45 %
Eagle Trunk.....dis 15 %
W. Wilcox & Co., Padlocks.....dis 45 %

Manure Forks.—W. O. & Co.....dis 50 %
Eastern Tool Co.'s.....dis 60 %

Mattocks.
K. P. & Co., Long Cutter, $16.00 ₱ doz....dis 50 & 10 %
K. P. & Co., Short Cutter, $15.50 ₱ doz..dis 50 & 10 %
K. P. & Co., Pick Cutter, $16.00 ₱ doz....dis 50 & 10 %

Measuring Tapes.—Eddy's.....dis 20 %

Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's (new list).....dis 40&10 %
American.....dis 33⅓ %

Money Drawers.—Tucker's Alarm.....₱ doz $22.50

Mouse Traps.—Delusion.....₱ doz 1.25
Novelty.....₱ doz

Nails......₱ keg

Oilers.—Zinc and Tin.....dis 60 %
Brass and Copper.....dis 50 %

Ox Bows.—Extra finished and varnished....dis 10 %
1¼ in., ₱ doz. pair...$7.00 | 2 in., ₱ doz. pair..$10.00
1⅜ in., ₱ doz. pair... 9.00 | 2½ in., ₱ doz. pair.. 12.00

Paper.—Common Tarred Sheathing.....₱ ℔ 1½¢
Eagle Brand Tarred Sheathing.....₱ ℔ 2 ¢
Common, Dry Sheathing.....₱ ℔ 1½¢
Eagle Brand Dry Sheathing.....₱ ℔ 2½¢

Picks.—K. P. & Co., Adze Eye, 5 to 6 ℔ $12.00. dis 50 & 10 %
K. P. & Co., Adze Eye, 6 to 7 ℔ $13.00.....dis 50 & 10 %

Planes.
Auburn Tool Co., Bench.....dis 20&10 %
Auburn Tool Co., Fancy.....dis 15&10 %
Auburn Tool Co., English Iron.....dis 15&10 %
N. Y. Tool Co., Bench.....dis 25&10 %

Plated Ware.—Rogers & Bro.....dis 50 %

Pliers.—Vom Cleff & Co.'s.....net list
Button's Wire Pliers.....dis 33⅓ %

Plumb & Levels.—Stanley R. & L. Co..dis 65&10 %

Pocket Knives.—American Shear Co.'s.....dis 40 %

Potato Diggers.—W. C. & Co., reduced list.dis 50 %
Eastern Tool Co.'s.....dis 60 %

Pulleys.—Acme or Excelsior, 1¼ in.....₱ doz 22¢
Acme or Excelsior, 2 in.....₱ doz 25¢

Pulley Blocks......dis 40 %

Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 40 %
Iron Pitcher Spout.....dis 50 %
Copper.....dis 30 %

Rivets.—Black (new list).....dis 40 %
Carriage in 10 ℔ papers (new list).....dis 40 %
Copper.....dis 50 %

Razors.—Torrey's.....dis 30 %

Rules.—Stanley, Boxwood.....dis 70&10 %
Stanley, Ivory.....dis 50&10 %

Sad Irons.—Common.....₱ ℔ 3¢
Laundry.....₱ ℔ 6½¢
Tailors' Geese.....₱ ℔ 6 ¢
Enterprise "Potts".....dis 35 %

Sash Locks.—King & Hutchinson's, new list.dis 40 %

Sandpaper.—Baeder & Adamson.....dis 35 %

Sash Weights.—Patent Eye.....₱ ℔ 1¼¢

Saws.—Hand Saws, Disston's.....dis 20 %
Cross-Cut Saws.
Disston's, Common Tooth.....₱ foot 68¢, dis 40 %
Disston's Great American Tooth..₱ foot 68¢, dis 40 %
Boynton's Lightning Tooth.....₱ foot 45¢
M. B. & D., Hand Saws.....dis 33⅓ %
W. M. & Co.'s Circular Saws.....dis 35 %
Richardson Bros.....dis 25 %

Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 10 %
Welch & Griffith, Extra.....₱ doz $8.40
Welch & Griffith, No. 2.....₱ doz 7.00

Scales.—Fairbanks.....dis 20 %

Screws.
American Flat-Head Iron.....new list, dis 75 %
American Flat-Head Brass.....new list, dis 75 %
American Round-Head Brass.....new list, dis 65 %
American Round-Head Iron.....new list, dis 70 %
Grilley Round-Head Nickel-Plated Common..dis 50 %

Scythes.—Clippers, in boxes.....₱ doz $6.50

Shaves.—Kimball's.....₱ inch 7½¢
Watrous.....dis 20 %

Shears.—American Shear Co., new list.....dis 70 %

Shot.—Tatham's.....₱ ℔ 6¢

Shovels.—O. Ames, new list.....dis 17½ %
O. Ames, other brands, new list.....dis 17½ %

Sinks.—Magee Patent.....dis 20 %

Snow Shovels......$4.00

Skates.—Union.....dis 25 %
Acme.....dis 25 %
Oxford Rink Roller.....₱ pair, $2.50
Union Roller.....dis 25 %

Stocks and Dies.—King's.....dis 10&5 %

Tacks.
Swedes Tinned.....dis 30&10 %
Swedes Iron.....dis 30&10 %
Gimp and Lace.....dis 20&10 %
Copper Tacks.....dis 30&10 %
All balance on list.....dis 20&10 %

Traps.—Oneida, Genuine.....dis 33⅓ %
Oneida, Imitation, H. & N.....dis 60 %
Blake's.....dis 40&10 %

Vises.—Simpson's Adjustable.....dis 25&5 %
Howard Vise Co.....dis 25 %
Prentiss'.....dis 20 %

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In 25 feet boxes: No. 1, ¼ in. wide, ₱ yard, 10¢; No. 2, ⅜ in., 15¢.; No. 3, ½ in., 20¢.; No. 4, 1 in., 25¢
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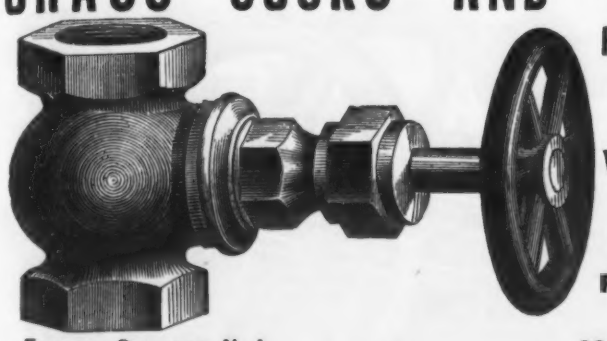

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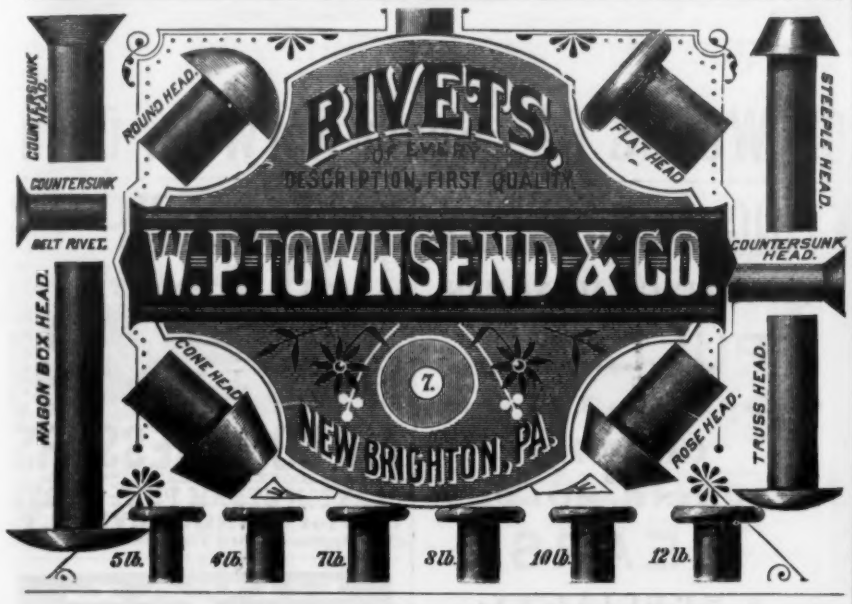

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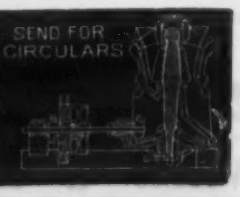

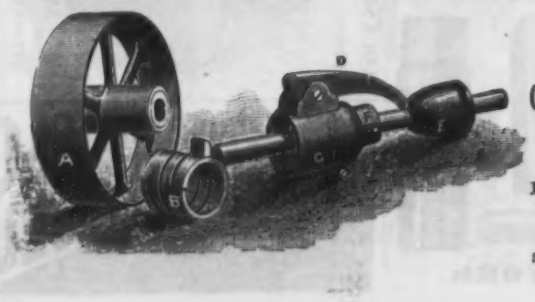

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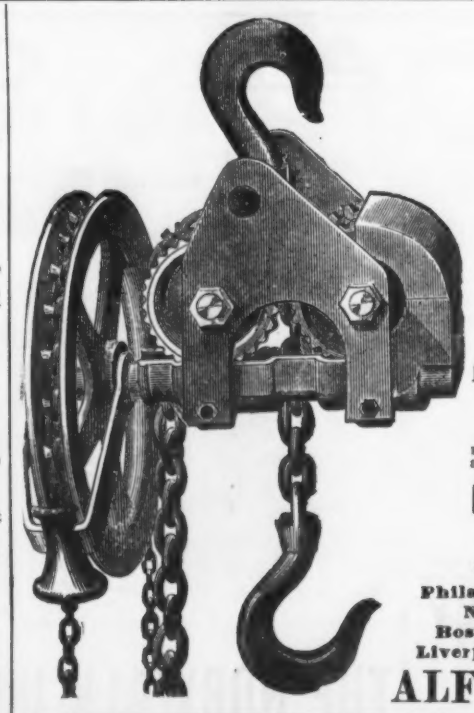

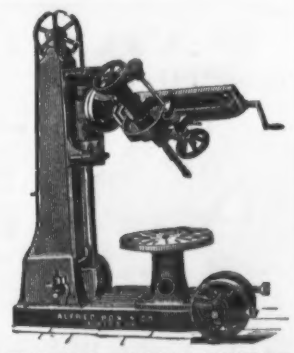

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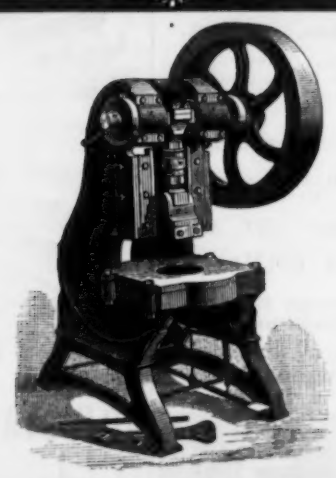

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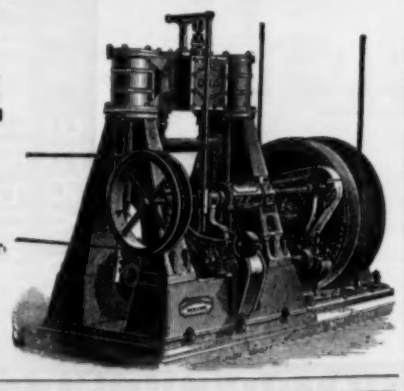

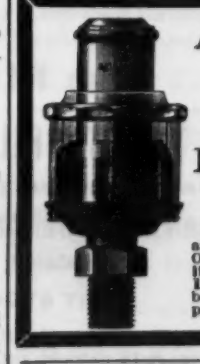

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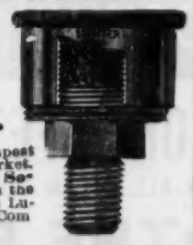

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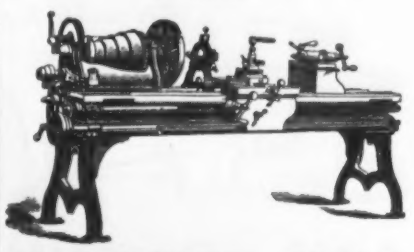

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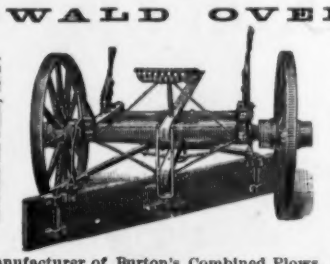

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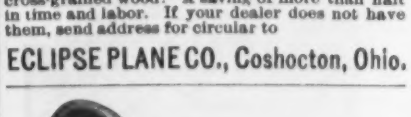

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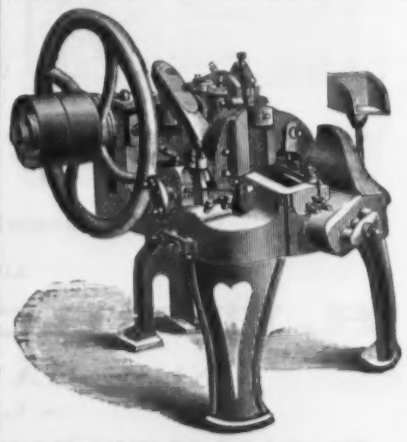

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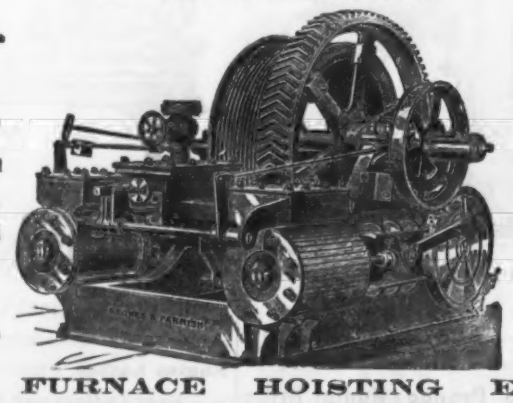

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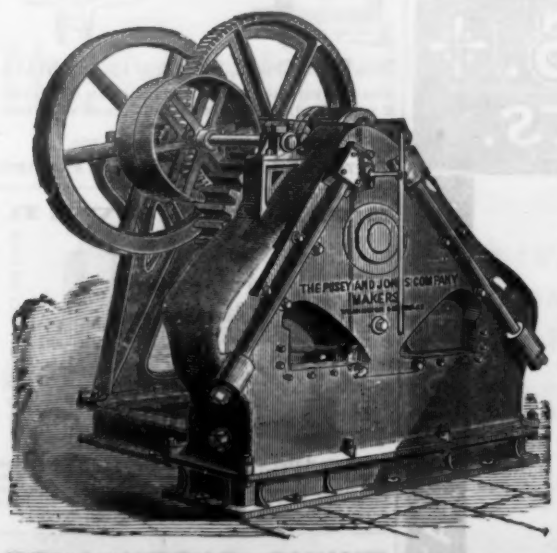

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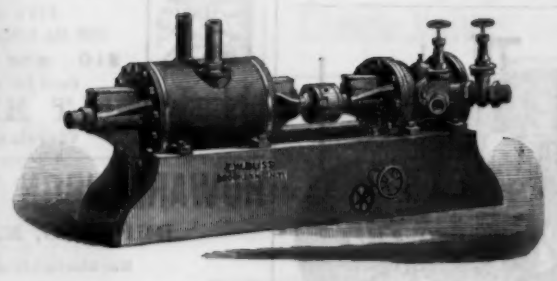

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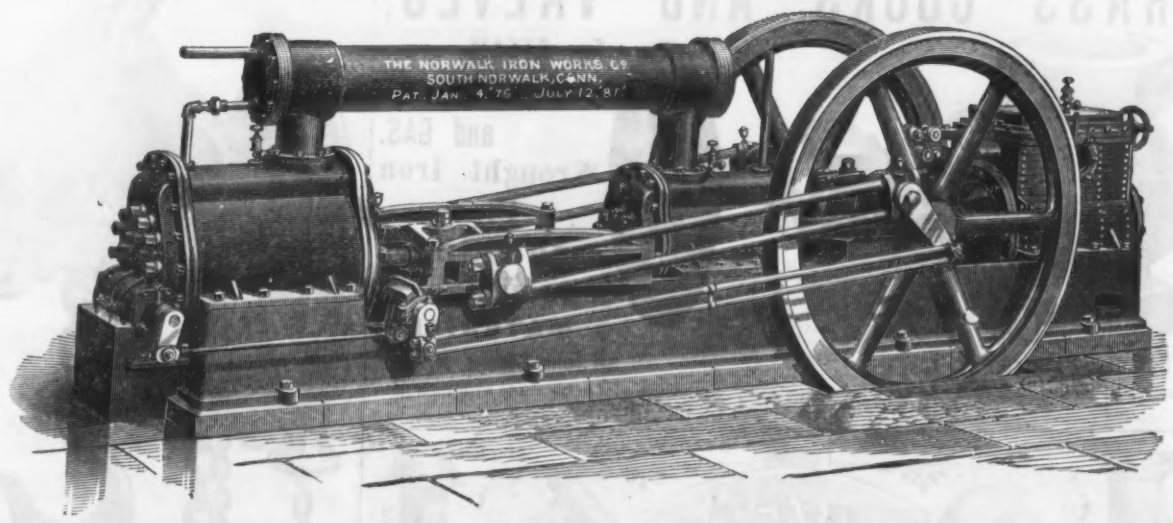

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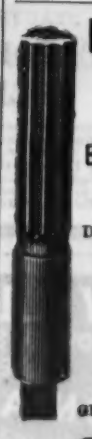

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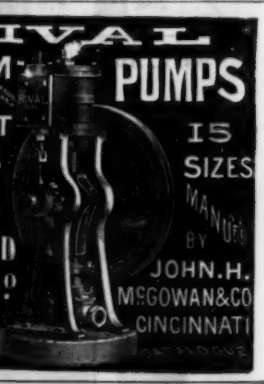

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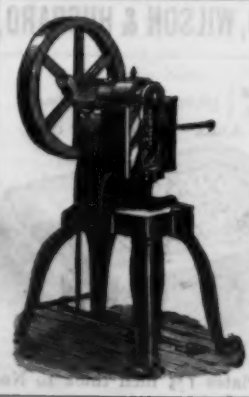

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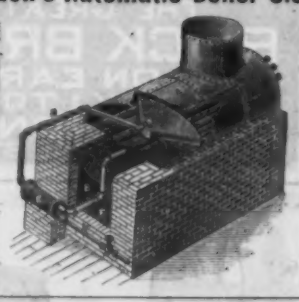

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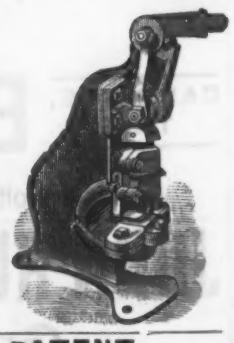

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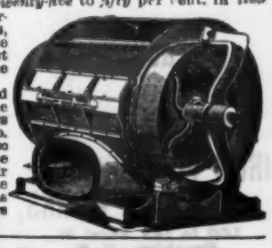

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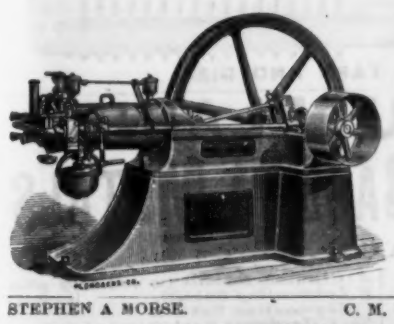

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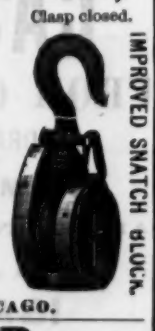

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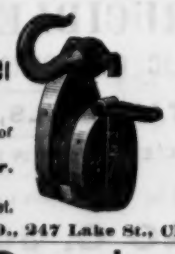

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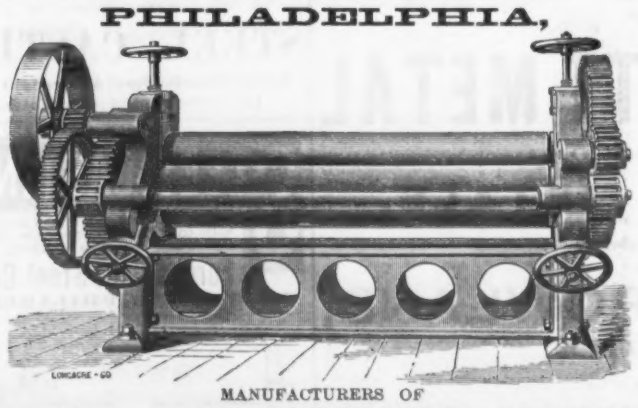

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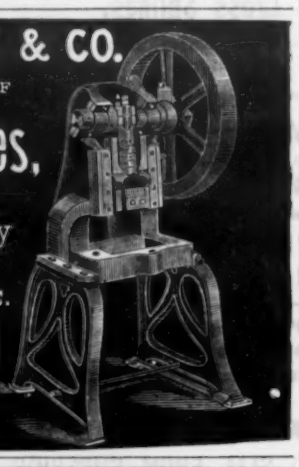

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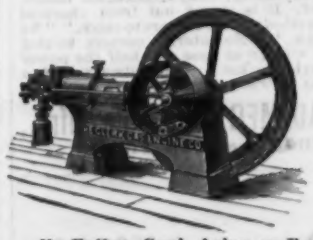

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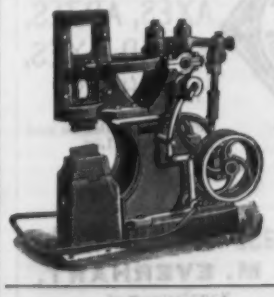

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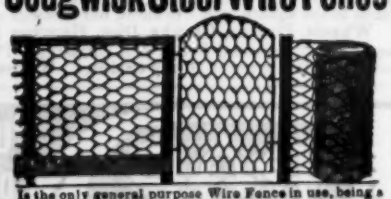

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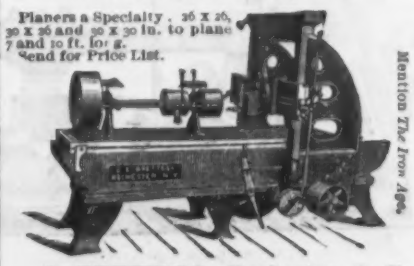

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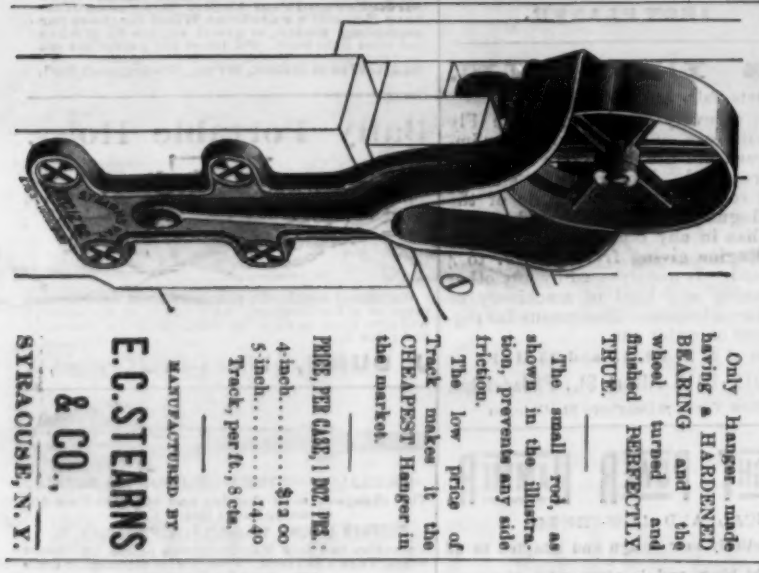

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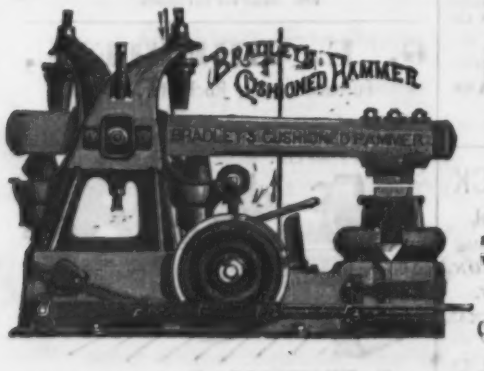

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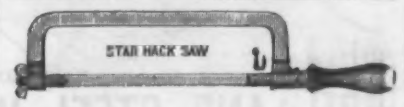

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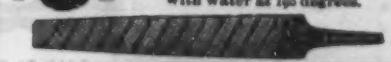

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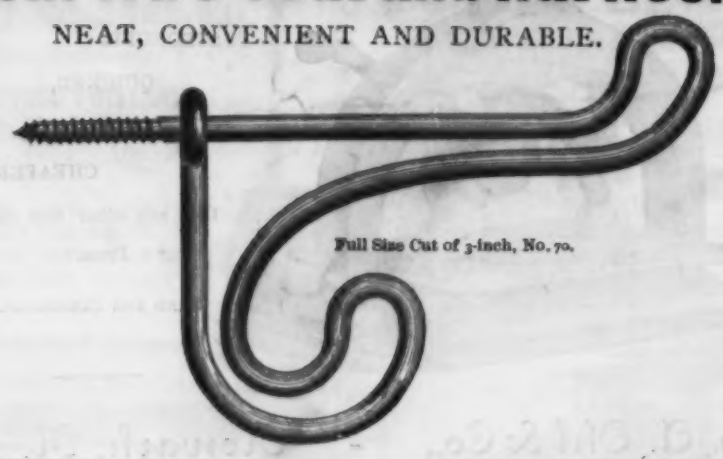

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	No.	Per Gross.	No.	Per Gross.	No.	Per Gross.
2 inch	50	$1.75	450	$4 75	750	$10.00
2½ "	60	2.00	460	5.00	760	11.00
3 "	70	2.40	470	5.40	770	13.50
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